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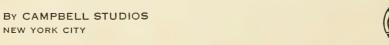
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The back numbers of "Camera Work" have been purchased from Alfred Stieglitz and are now on sale at Wanamaker's, Philadelphia. "Camera Work" was devoted to Pictorial Photography. Each number contains several pictures by one or two Pictorialists. Some of these numbers are now very valuable to collectors.







PHOTOCRAPHIC JOURNAL MERICA

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POSING, LIGHTING, AND ARRANGEMENT OF PORTRAITS'

By F. C. TILNEY

THE first heading upon the synopsis is the subject of posing, and the first subheading action and repose. Energetic sitters, especially men, should not be taken in relaxed attitudes. That sounds fairly dictatorial for a start, and I make it an opportunity for explaining that the use of the word "should" and similar dogmatic tricks in this lecture is merely one of expediency. It would mean a sinful waste of time for me to interlard this discourse with due and fitting expressions of modesty and apologies for opinion. After all, you are here to know my opinions, and where you disagree with them I could not mend matters by asking indulgence for them. Kindly, therefore, accent the word "should" as a mere convenient form of speech and nothing more.

To resume then: Public characters, such as energetic members of Parlia-

¹ A lecture before the Professional Photographers' Congress of London.

ment, explorers, and so forth, are subjects demanding a pose that shall stamp them as men of action even in the eyes of those who know nothing of them. In these days, too, there are ladies whose political ambitions would bar the use of the easy chair and the languid smile, and if one had to draw the line at a stone or a hammer, at least one would not give such a person a kitten to nurse or fancy-work to toy with.

It is easy in a pose of energy to make artistic faults. Gesture must be rigorously eschewed. The hands, of course, must be doing something, but the energy of the pose should exist in the sitter's backbone; that is, in the general alertness of his torso, rather than in the disposition of his limbs. We want to emphasize the sitter's mentalities, not his physical suppleness. Directly actual gesture comes in mere portraiture is sacrificed to dramatic considerations. A person whose life is made up of thought and action may

very well show purpose by displaying a book, a sword, or other accessory of his calling—so long as it is one of the polite professions. Mere trade objects are, of course, barred, because most people avoid the signs of trade, but will swagger proudly with test-tubes, documents, palettes, musical instruments, swords, and so forth. The thing is to achieve the alert pose. The head may be turned a little, but very little, for the turned head is more the characteristic of the suave man than of the energetic. The eyes should be raised and the head, too, somewhat, and the spine should be braced rather than relaxed. A standing pose is best of the soldiery order—both feet bearing the weight equally, the body tense and balanced ready for movement.

Where ladies and children are energetic and active many of the foregoing remarks may apply. With seated figures the spine again is the great factor. Standing or sitting it is better not relaxed, so as to take a double curve; but it can be flexed at an angle from the pelvis and preferably bent forward. You will recall the energy of the forward bend in D. O. Hill's well-

known Mrs. Jameson.

Repose

In the case of people who are thinkers —poets, artists, and so forth—or who are merely handsome or luxurious, the reposeful attitude avails and is perhaps easier to manage. As a rule the relaxed spine gives the suavest line, because it usually lies in a double curve. If the elbow is resting upon the arm of a lounge-chair or other support the body will take good lines for the purpose, for the mass will be thrown over to the side of the supporting elbow, thus tilting the shoulder line and showing the settled, sluggish sort of look that is the opposite of the square level shoulders of the man of action. would remind you of Hollyer's portrait of Walter Crane as a remarkable example. In the seated figure there is, with men, a tendency to cross one leg over the other. It is seldom satisfactory at full view. Crossed legs demand

trimming just below the knee. Only in profile are they tolerable, because then the feet are no nearer the camera than are the hips. But I would beg of you in the general contentment of the race, not to turn out too many hundred versions of the Whistler-Carlyle trick. At any rate, please never jam the man sidewise against a wall for the purpose, because no man in his senses ever sat so in actual life, as Carlyle and Whistler ought to have seen. In standing, the weight will generally be upon one foot only, and the hip thrown out and the shoulder on the same side lowered in consequence. A turn of the head will supply grace to the movement.

Dignity

The photographer will be advised to preserve the dignity of the sitter of either sex. If the person's carriage is one of consequence it may be concluded that dignity and importance is a cultivated characteristic, and such persons will not be flattered by a result that does not show it. Moreover, they probably know and could tell the operator that a proud bearing suits them better than any other.

Homeliness

The opposite state of things is true in the case of a homely looking person. A kind, motherly, adipose lady with a pleasant smile need not even hold the usual book. She can caress a domestic pet and her attitude should be settled and comfortable. In the case of the man it would seem that homeliness is not a characteristic that should be emphasized. One would certaly try to invest the much-married, suffragetteridden husband with all the strength and manliness he could assume. a youth may be homely without hurt and take any lolling or free and easy pose.

Children will easily fall into their proper classification. There should be no difficulty in finding out whether they are bright and animated or shy and quiet—sedate, demure, naive, pert,

curious, deferential, and so on. Whatever it is it should be seized upon as a motive for the pose, so that the fond relatives may exclaim: "Isn't that exactly like that sweet little thing?" or "That's the little rogue to a T!"

Posing for Pattern

The graceful posing of ladies is very well understood by photographers who have a lot of it to do, and probably the most unsuccessful of them have learned more of the matter by experience than I could tell them in theory. The great thing is to get the masses to hang suavely together, and this is very largely concerned with the principles of radiation of line. When I have said that the undulation of the spine usually sets the key for these line harmonies I have said all that is due under the head of posing. The rest is a matter of design, pure and simple.

Design

It should be understood that the principles governing a piece of ornament or the forms of plant and animal life are identical with those that govern pictorial composition. Very briefly summed up they are that lines should not be parallel, but should flow in radiating groups from centers. The lines of a portrait are supplied by the contours of the figure and the folds of the drapery. All these must appear to be actuated by forces which act harmoniously together. If some of these should run at right angles they would seem to be due to a discordant force and should be avoided, although a rightangle direction may be useful at another part. One motive alone should dominate the composition.

It is often possible to enhance the attractiveness of a subject by adding something in the way of an accessory to the figure. Lines and masses that are a little stubborn may be coaxed round by the accessory object, as in the case of the damsel on the screen. The two arms hanging almost parallel

and the vertical lines of the dress would of themselves lack motive and interest: but the artist has obviated this by placing the urn in one hand so that the lines of it pass easily through the hands and wrists, providentially turned to receive them, and thus connect up a pleasing circuit throughout the length of the figure, doing so in such a way as to break and ameliorate the straight lines of the dress. The part played by this urn in the general shape of the mass brings us a step further upon our synopsis, and we reach the subject of pattern.

Pattern

The designing of the pose of a figure concerns a photographer in exactly the same way that it concerns a sculptor. This fact is quite easily appreciated by the photographer when the figure happens to be a nude or something so near to it as to make no difference; but it appears to be lost in the more usual cases of a plenitude of clothes. One sometimes sees figures that look like conical bundles of garments with the head atop. Certainly some subjects are indeed almost devoid of posing possibilities. Still, there are always arms and a body to bend one way or another, and with these two factors it should be possible to get something like a pleasing line. What one has to think of in this business is the pattern or the silhouette of the subject and how it cuts against the background.

If the sitter's figure is lithe and shapely there should not be much difficulty in making it furnish the pattern in itself; but where massive figures, either from age, voluminous clothing, or other causes, almost render the case hopeless, then recourse must be had to accessories with which to help out the lines and masses. We saw how in the case of the damsel at the fountain her ewer or urn served such a useful purpose. In modern portraits the large hats of ladies frequently give valuable help in this respect. A portfolio, an animal, a curtain, a table, and similar objects may furnish means for supple-

menting the mass of the figure.

Spacing and Trimming

One of the secrets of a pleasing pattern is that it should not lie too far within the bounds of the picture. It is often of advantage to let the outer edge actually cut into the subject here and there. Only I must make a little reservation in this case. The only thing I have against this noble and exquisite picture is the fact that the artist has cut through his fingers. This is an unnecessary mutilation that I should excuse in nobody.

Relation of Parts to the Edge

But, the lamentable fact notwithstanding, we can see that the form or pattern, being thus welded to the edge, gains a decorative import. The planning becomes a deliberate artistic effort to make the pattern fill the space to advantage, and the edges are not then the negligible quantities that they are when the subject is confined to the inner area. But all such matters must have careful consideration. It is sometimes seen among amateur photographers what mischief may be done by ruthless and ill-advised trimming. There is one word of advice that may be welcome to a few, and which I may very well submit here. In cutting into a mass by trimming, it is seldom fortunate to eliminate more than half of any recognized form, say, for example, a sculptured urn. If the greater part is lost, what remains is usually of an unshapely pattern, and moreover the idea is aroused that the object is squeezed in from the outside. It is better looking as though it were a necessary part of the design, which it would do if the greater part of it were inside the boundary. It makes finer design for the trimmed object to increase in bulk from the place where the edge cuts it. Imagine these differences of treatment in an urn or marble bust or a bowl of flowers, or a flying drapery, and you will see the force of such an apparently trivial matter. But as to this question of spacing, a good many painters of the first order have allowed plenty of space around their figures. A style that is good does not necessarily imply that its opposite is had. You may trim close or be expansive. The difference is that of good wine and good bread—both excellent things; not the difference of good wine and bad wine.

Under the heading of spacing or trimming we must also consider the relation between the subject in the negative and its placing upon the print. We are all familiar with the cabinet photograph upon which the head and shoulders appear to have slipped down an inch. It is quite possible that such heads have been deliberately placed in the absolute center. A scientific mind would consider such an arrangement orderly and desirable. But the mathematical center is by no means the sensuous center—an instance of the difference between science and art. If a spot is to look in the center of a parallelogram it must be higher than it looks. This is a golden rule which I strongly commend to your consideration.

Another fault is one which causes a head to look lost amidst its surrounding. It is often visible in heads which are vignetted. When we have a feeling that we should like to trim half an inch off all around a cabinet print the meaning is simply that the head is too small. There should never be a sort of fight between a head and the plain space surrounding it. The head should be big enough to command the whole field, otherwise it will have the footling appearance that is prejudicial. The larger the head the less room there is to go wrong in placing it upon the field. Nevertheless danger lurks in the extreme. About twenty-five years ago the Americans introduced the enormous head, only just squeezed into the field by grazing the top curl and the chin. These things were distinctly unpleas-They looked monstrous; but they really only wanted more room, which would have obviated the stale and second-hand look they had of being enlargements cut down to be squeezed into a cabinet album.

Sometimes a good and rather decorative effect is gained by placing the head at the top of the picture, or, at

any rate, far enough above the ordinary center to make it relinquish all claims to that position. This plan is good if there is enough of interest either in subject or treatment to warrant the inclusion of so much body beneath. The ordinary commonplace dress scarcely does; but state robes and regalia or special costume may give the idea an excuse. It certainly lends itself to design and pattern much more usefully than does the head in a more central position. In the case of a lady's head and bust it may be possible to make each occupy about half the field. But here again there is an extreme of which to beware. To get the head too high and small is to trespass on the domain of the large picture, in which case the result will resemble a miniature of the accepted half-length painted portrait. I don't know that there would be any crime in that; but in these days the head is the most important part of a portrait, and seems to hold good claims to all the available space.

Another drawback, to a small head, unless vignetting is resorted to, is that we may get disturbing spaces between the arms and waist, and those are best

avoided.

The last point under the heading of spacing and trimming is one which is constantly overlooked; indeed, it is one of the commonest mistakes among photographers. It is to allow a head or figure to be too near the side toward which it looks.

Unless a figure looks straight out before it, which is rare except in amateur productions, it will be found to give interest to the side toward which the face is turned. The opposite side is therefore of much less importance, and seems redundant unless it is well trimmed.

Lighting

We must now consider the subject of lighting. One would think that photographers had little to learn on this subject considering that monochrome photography is nothing else than a record of much or little light upon objects. Yet it has been pointed out to me that there are practising pho-

tographers with good connections and paying business who are ignorant of the elementary principles of light and shade. At the risk of boring others who are masters of this subject I feel called upon to treat it ab initio. A glance into the sky when it is filled with masses of cumulus clouds is sufficient to prove that not only does light and shade reveal character and beauty, but it is also directly responsible for modelling. The cloud that sails under the cloaking of higher masses obscuring the sun is possibly just as varied in mass, yet it appears to be flat and nebulous. The one in bright sunshine is, of course, nebulous also, but it appears to be carved in a firm substance. The most rugged modelling tells for nothing in a diffused or an equal lighting. Imagine yourself looking along the furrow of a newly ploughed field with the sunshine behind you. How much is seen of the furrows?—positively nothing! The field looks as though it has just been rolled. But look again when the sun has travelled round some way, and the field is then scored with sharp dark lines alternately with light ones. Those who are out of the way of ploughed fields can try the experiment upon a corrugated iron roof or a piece of patent strawboard packing.

Simple Lighting

It follows that if we have arrangements for altering the direction of light in our studios we can at will either reduce to a minimum the modelling upon the faces of our sitters or exaggerate it to the utmost strength. is evidently the greatest power in the operator's hands-a power for the enhancement of character as well as for the refinement of roughness. I feel bound to say here that it seems to be the accepted thing that professional photography should find its ideals either in the gently lit portrait with the light diffused, or else in having shadows discounted by reflections to the elimination of the full tone of the modelling. These methods are not conducive to the beauty of modelling. The interest and charm of the wrinkled and intelligent face of Dürer's father now shown lies in the frank portraval of every furrow, facet, and plane of the fine old face. A diffused lighting would have upset all this, and a strong light from one side opposed by lights reflected into the shadows from the other would have confused it. I need only remind those who are familiar with D. O. Hill's work that his great success in the likeness, character, and sculpturesque grandeur of his heads is due almost entirely to the unsophisticated manner of his work. He used the naked sun as an illuminant, and thus got the contrast offered us by the ploughed field under similar conditions. His slow lenses and slow plates kept all his shadows darker than a technician of today would permit; but the final result lost nothing thereby from an artistic point of view. If you have a seared old dowager who is ashamed of her wrinkles, no doubt the only thing to do is to light them so that they appear at their minimum; but the same method is very frequently employed for subjects in no such need, such as young women and children. A young child's soft skin and smooth flesh, its melting planes and rounded contours, are in no more need of diffused lighting than a billiard ball would be. On the contrary their beauties are enhanced by being treated in such a way that the delights of the modelling gain their utmost chance.

Complex Lighting

In every well-equipped studio movable blinds can be adjusted so that a directed ray can fall from the side, from above, from behind, or from the front as occasion demands. Usually one side is left practically without entry of light; but this side is generally only too well provided with reflecting surfaces. In a studio built upon the green-house principle it is possible to get light upon all sides of the figure in imitation of an outdoor effect. Such studios are valuable for figures supposed to be engaged in open-air pastimes, but they seem to be in more need than the indoor studio of pictorial backgrounds and other paraphernalia.

The lighting of figures in them is naturally very highly complex, and may give a lot of trouble for doubtful results. The effects may be very novel and charming; but unless the photographer is very much of the artist he had better rely upon the old traditions of lighting tested and tried by painters all through the ages and never yet weighed and found wanting. The best of these is the more or less direct and simple light falling from a point in front, at the side, and slightly above the sitter. If the light comes too full upon a full-face the nose may have a shadowy tone upon both sides of it which is not desirable. The old painters, among them Rembrandt. admitted the light from a very small window, rather high, into an otherwise dark studio. Painters in these days temper this method without, however, loosing sight of the principle of the direct and simple light when portraiture rather than a pleasing head is the object. In the case of scenes containing figures, such as garden pictures, interiors, and so forth, the conditions are different, for we are not then dealing with the portrait pure and simple, but with a host of other things appertaining to the other arts of genre and landscape. If then it is desired that the sitter shall be subjected to these other pictorial considerations, the employment of cross-lighting, diffusion, and reflected lights may be indulged in to any extent; but so long as the portrait, the sitter himself, is the chief motive of the effort, then the simpler the lighting the easier will come success.

Reflected Lights

The use of reflectors may easily degenerate into an abuse of them. The photographer is frequently quite obsessed with the notion that they will "clear up his shadows." They should, however, be in no need of clearing up if everything is in order. The carte de visite of the sixties exhibits a strength and virility which differentiates it from the highly wrought and often emasculated print of today. I imagine that the studio arrangements were

simpler in those old days. Shadows were not lit up until they lost their quality and richness. It should not be overlooked that reflected light is usually made to fall full upon the shadow side, with the result that any modelling there is flattened out of existence on the principle of the sun full on the furrowed field. Add to this defect the still more invariable treatment by a process extensively employed today in all photographic businesses, and one that I have been advised not to touch upon, and we have our shadowed side reduced to the interest of a piece cut out of a gray mount

There is, nevertheless, a system of presenting portraits that are all shadow except for an edge of light. I think these are described as "Rembrandt" portraits. although anything unlike the practice of that immortal master does not lie within the possibilities of photography. I say nothing either for or against it. It may be well or badly done. At the best it is fantastic, and to be tolerable it demands the utmost nicety of modelling. Allied to this style is a fault, often noticed, of lighting a full face too much from the side so that an aggressive line of light strikes the ear and passes round the head. Now has the ear the best claim to be emphasized in a portrait? It appears to me that the eye and brow are the seat of the mentalities and can best stand the emphasis of the highest light. One may get novel and airesting effects from lighting the head from below or behind, but it would be impossible to make a practice of such modes, and it certainly behooves photographers to make themselves masters primarily of the time-honored customs of lighting.

Concentration and Diffusion

The question of lighting not only effects the likeness of the sitter, but it also governs the pictorial conditions of the whole thing. A concentrated lighting usually implies a dark environment, and a diffused lighting one in which everything is in a comparatively light key. The alternatives are, of course, matters of choice.

Contrast and Flatness

The thing to be borne in mind is that over-contrast and over-flatness are both unequally undesirable. most forceful effect should have a general harmony and relation of parts. Accessory objects and other masses all dark but picked out with edges of light are thankless materials for the make-up of a good picture; while, on the other hand, the feeble effect of a flatly-lit composition will certainly induce apathy in the spectator. A portrait may be, as we often see, in a very light key, and yet suggest full roundness and modelling. But even the light-keyed efforts are apt to pall.

(Concluded next month.)

RECOVERING SILVER FROM FIXING BATHS'

By ALFRED B. HITCHINS, Ph.D., F.R.P.S., F.C.S.

THERE have been many requests recently in the photographic press for methods of recovering silver from exhausted hypo baths, but most of the methods suggested cost more to carry out than could be obtained for

¹ Communication No. 17, Ansco Research Laboratory.

the silver recovered. In precipitating silver as sulphide from a hypo bath any one of three substances may be used:

Potassium sulphide (not monosulphide), having the formula $K_2S.5H_2O$. Potassium sulphuret, having a variable composition. Sodium sulphide, having the formula $Na_2S.9H_2O$.

In choosing one of these substances it must be remembered that it is the sulphur that brings about precipitation and nothing else in the compound. The amount of reacting sulphur in each of these three substances is as follows:

Substance	Per cent. available sulphur		
Potassium sulphide, K ₂ S.5H ₂ O	16.00 (theoretical)		
Potassium sulphuret (no formula)	12.79 (determined)		
Sodium sulphide, Na ₂ S.9H ₂ O	13.35 (theoretical)		

It is therefore evident that of these three compounds potassium sulphide contains the most sulphur, but the price of potassium compounds in these days makes them too costly to be considered. The following, taken from a chemical catalogue, give a recent price for the three materials:

Substance]	Price per pound
Potassium sulphide			. \$1.48
Potassium sulphuret			. 1.35
Sodium sulphide .			55

Therefore in purchasing sodium sulphide one is paying 4 cents per cent. for sulphur; for potassium sulphide 9 cents per cent. sulphur, and for potassium sulphuret 11 cents per cent. sulphur. With these facts in mind it is obvious that sodium sulphide must be used as a precipitant where cost is a consideration. Adding a saturated solution of sodium sulphide to the hypo bath in slight excess will completely precipitate silver as silver sulphide with minimum cost and labor.

In these days most hypo baths contain alum, and therefore a small amount of aluminum is carried down with the silver; however, there is not enough to become a serious matter. If it is desired this aluminum can be got rid of as follows: A small amount of ammonium hydroxide is added to the hypo bath until a faint odor of ammonia is noted. The solution is then stirred well, and the aluminum hydroxide, which precipitates out, is allowed to settle, filtered, and washed with hot water, the washings being added to the major portion of the filtrate. For all practical purposes there is no need

to separate the aluminum; it may be allowed to precipitate with the silver and will be carried down as aluminum hydroxide.

Most hypo baths are acid and there is no need to add any acid to the hypo solution previous to precipitating with sodium sulphide. A wooden or earthenware vessel is best to use; no metal receptacle should be used as some silver is lost be deposition. The saturated solution of sodium sulphide is added until all the silver is completely precipitated as silver sulphide. This may easily be determined by allowing the sludge to settle, leaving the supernatant liquid clear, then running in a small additional amount of sodium sulphide solution. If more sludge is formed, the silver has not been completely precipitated and more of the sulphide solution is added. The precipitating vessel should be fitted with a tap, some 5 or 6 inches from the bottom so that when the silver has all been precipitated and settled the supernatant liquid can be drawn off and further waste solutions treated. When a sufficient amount of the sludge has collected at the bottom it can be washed with cold water by decantation and poured into some suitable container in which it can be sent to the smelter. Some methods have been suggested of recovering silver by deposition upon brass or copper. This, however, is not at all satisfactory. For one thing the deposition is very slow, a complete recovery of the silver not being possible in reasonable time.

A number of determinations have been made of the amount of silver recoverable from fixing baths, and allowing for the different amount of work done by the various baths an average of 0.7375 grams per 1000 c.c. of bath was obtained. For those who are interested in the chemistry of the reactions and a description of the method of determining the silver content of a hypo bath the following is given. The usual acid fixing bath contains, in addition to hypo, sodium sulphite, acetic acid, and alum. In a used hypo bath there are present the following substances:

Ag₂S₂O₃.Na₂S₂O₃, Na₂S₂O₃, NaBr, Na₂SO₃, $Al_2K_2(SO_4)_4.24H_2O$, $HC_2H_3O_2$.

The usual Volhard's method for the determination of silver cannot be used on such a bath without a modification. If the bath were made distinctly acid with HNO3 for a direct titration with NH₄CNS, sulphur would be precipitated from the excess Na₂S₂O₃ and consequently interfere with a correct titration. The modified method of analysis is as follows: 100 c.c. of the bath measured into a beaker and made slightly ammoniacal with NH₄OH. solution is heated slightly and the Al(OH)₃, which precipitates is filtered and washed thoroughly in hot water. By this means the aluminum in the alum is got rid of. To the filtrate a small excess of sodium sulphide in water solution is added, the following reaction taking place:

 $Ag_2S_2O_3.Na_2S_2O_3 + Na_2S = Ag_2S + 2Na_2S_2O_3.$

The Ag_2S precipitates, leaving the excess Na_2S and $Na_2S_2O_3$ in solution. The substances in solution are separated from the Ag_2S by filtration and a thorough washing of the precipitate with cold water. Hot strong HNO_3 (1:1)

is now run through the filter paper containing the Ag_2S . This procedure with HNO_2 is repeated until nothing but sulphur remains. The following reaction takes place:

 $Ag_2S + 2HNO_3 = AgNO_3 + H_2S.$

The solution is gently boiled to get rid of $\mathrm{H}_2\mathrm{S}$, although part is oxidized to free sulphur, which remains on the filter or comes through in a colloidal state. This latter fact does not interfere with correct results. The solution is next titrated with $\frac{\mathrm{N}}{10}$ NH₄CHS, using 5 c.c. of a saturated ferric alum solution as indicator. The first permanent tinge of pink is taken as the end point. The computation to determine silver content is as follows:

Ag titre of NH₄CNS \times No. of c.c. NH₄CNS = grams Ag in 100 c.c. of bath. (No. of c.c. of bath \div 100) \times grams Ag in 100 c.c. = total grams of Ag in bath.

If only an approximate estimate of the amount of silver recoverable is desired it may be obtained by weighing the dried silver sulphide 1.148 parts by weight of silver sulphide is equivalent to 1 part of metallic silver.

THE PERSONAL ELEMENT IN PHOTOGRAPHY

By GEORGE H. RYDALL

THERE are some photographers who object to make use of comparatively recent aids and processes which render to many such valuable assistance in acquiring technical excellence in photography. Actinometers, factorial development, time development, graded printing papers, and even graded plates are looked at askance by them and regarded merely as appliances and snares for decoying novices. Say these sages: "You must learn to judge the correct exposure, examine the negative and control its development, get to know one plate and always use it, and make all your prints on the same kind of paper." Excellent photographers are many of these. With a look at the subject and a look at the clouds, they readily decide what stop to use and what exposure to give. Their work is often beautiful, and by their work we must judge them. They pride themselves on always being able to obtain twelve good negatives from a dozen plates, and their pride is justified by their results.

What is the secret of their success? "Ah," they reply, with a look of wisdom, "experience—and the personal element." We bow our heads and retire, regretting that fate has decreed that we were to be made somehow, and not to be born. "A born photographer!" Can't one be made? After serious meditation, but still in a humble state of mind, we begin to believe that one can. We even

dare to hope so, and we return to our actinometer, factorial development, "special rapid" and "ordinary" plates, and to our packets of different grades of bromide or gaslight papers. Novices we may be, but we decide to make use of simple rules and simple aids in order to achieve some creditable success in the science and art of photography.

But what about the personal element in our photography? How are the photographs we take to reveal characteristics in us, with all these new-fangled

aids and appliances?

The science of photography has to be the means by which the art of photography is to be developed. Technical excellence has to be first achieved and achieved in the minimum of time, and then utilized in revealing the soul—the great personal element—of the photo-

graphic artist.

Photographic artists of the first grade are almost as well known by their productions as are painters. The photographer often specializes, chooses some subject, studies its moods, and selects for his studies those which are in harmony with his temperament. The sea exhibits as many moods as a girl in her teens. One man chooses to interpret the moods of the former, while another prefers to portray those of the latter, and so a photographer may exhibit personal traits in his seascapes or in his portraits. The man who can photograph the moods of the sea is indeed an artist, and one ventures to think that a first-rate seascape reaches the high-water mark of artistic photography—the ordinary "pictures" of the sea, like those of mountains, are so often soulless, and the grandeur and sublimity in each case are missed.

And isn't it difficult to faithfully portray a beautiful cathedral or a fine old church? Such an edifice is a prayer in stone, and he who would interpret such a prayer must needs be inspired. One sometimes fears that the majority of "picture" postcards of these buildings

are almost blasphemous.

"The camera cannot lie," say the uninitiated. Unfortunately, in the hands of many, it cannot speak the truth, for making a bad photograph is not revealing the truth. War prices and war restrictions have prevented many wouldbe photographers committing photographic atrocities. During the last two years there have been fewer facilities for taking photographs. This has led many to consider the artistic side of photography who previously were content to "snap" anything, and it has consequently led to a greater degree of expression of personality. It is to be hoped that this renaissance of artistic photography will continue to grow, for soul expression is good whether it take the form of poetry, prose, music, painting, or photography.

There are those even today who will not grant that a photograph can be a picture. On the other hand, there are photographers who will try to "fake" an effect in order to produce something which apes the pictorial. For instance, one of the latter spent the greater part of a misty morning near a small brook by the side of which a hawthorn bush

was growing. Houses, irregularly placed, stood on the summit of a slope beyond this brook and bush. The photographer placed his camera near the brook and waited for the mist to begin to lift. After some considerable time, his patience was rewarded by the houses just looming through the haze. Then he took the photograph—or, rather, he exposed his plate—afterward made a photographic enlargement from his nega-

tive, and, with the aid of a compressed paper stump and black chalk, produced his "picture." The brook was supposed to be a river; the bush played the part of a tree, and the houses posed as mountains. "Mountain Mists" was

the title chosen for this miracle, I think. Imagine waiting nearly three hours to tell a lie—a cold-blooded, deliberate lie—and then spending more time in making a permanent record of it. Why, diplomatists can do much better at that

game in a tenth of the time. What a pity to drag photography down to such

a low level!

There can be no real satisfaction in a "fake," for a "fake" can never be a picture. A good combined photograph, though, is not a "fake." Did the great painters paint scenes exactly as they appeared? One believes they did not.

The scenes led them to conceive something often more beautiful, and their interpretation of the beautiful was the picture. These artists often omitted that in a scene which was irrelevant to the idea which they wished to express, and added what they considered would give a better expression of that idea. So, one contends, the photographic artist is justified, for instance, in producing a combination photograph. A cloud negative may be used with another landscape or seascape negative to produce a desired effect which is true to nature.

Happy is he whom nature favors by producing, at the same time, all the elements rightly composed, to express the idea which the artist has conceived. Photographers have been known to visit scenes day after day for weeks, waiting for the provision of those elements which were necessary for the faithful expression of the ideas which they had conceived. If, though, one can combine elements from two negatives, to produce that which on occasions nature does produce, one is justified in allowing science to act as the handmaid to art, by using technical skill to produce the desired effect. So also one is justified in controlling a print in such a way that the finished production is a soul expression.

Heaving billows may be accompanied by a clear sky. Stratus clouds may float over a fen land. But these skies are not usually associated with such a seascape or landscape. One thinks of scurrying clouds accompanying the wind-driven billows, and the majestically rising massive cumulus better expresses the idea of space above the low-lying plains. Why not use one's skill in bringing these elements together in order to give expression to a natural conception?

To get a snapshot one need only glance at the subject. To obtain a picture one must see the subject—see not only what is presented at the time, but also see what features are missing or what are superfluous and irrelevant, and either wait until these are suitably adjusted or use one's technical skill in composing the desired pictorial effect. It is here that the personal element plays such an important part. The seeing life beholds much that the casual onlooker misses, and enables one to find that which will best express some soul emotion.

One would reassert that photographic productions may be pictures in the truest sense of the term. People are often quite prepared to pronounce some fine descriptive piece of literature as a "word-picture." So also a musical composition may be a picture. Certainly a painter has the assistance of colors for the production of his picture, and there are those who seem to think there is some very special virtue in the colors, and that the use of a lens, a chemically prepared plate, and a piece of paper at once debars any production involving these from being a picture. But the pigments are merely messy chemical productions, the brushes used have had a very intimate association with a camel or a hog. and the hand that wielded the brush and manipulated the pigments is, we are told, the descendant of a monkey's paw.

The apparatus and material used do not make the picture. The personal element is the great factor in its production, and the photographer, young or old, who can bring this element to bear in his productions, utilizing to advantage whatever means science has placed in his power, may claim to rank as an artist.—

Amateur Photographer.

A PLATE dried in a warm atmosphere will become more intense than when dried in a cool or draughty place.

GLYCIN is a very suitable developer when hard results are wanted; black and white work, copying engravings, etc.

Double tones on print-out paper are caused either by the use of too much sulphocyanide, too little gold, or a partially-exhausted bath.

THE face or film side of bromide paper can always be distinguished by its curling inward.





















DESIGN FOR POSTER—"PICTORIAL PHOTOGRAPHERS OF AMERICA"
By M. B. WHITE, NEW YORK

PREPARING AMMONIUM, POTASSIUM, SODIUM, AND FERROUS OXALATES¹

By "CHEMIST."

7HEN preparing any of the abovenamed salts for photographic use the water employed should be distilled. If this is not easily procurable, then the water used must be previously boiled, to deposit any lime or organic matter contained therein, and filtered. Ordinary water contains more or less lime in solution. The oxalates, particularly ammonium oxalate, are used as a chemical test to ascertain if lime be present in water. Should it be present, oxalate of lime is produced, and precipitated as a white powder which is insoluble in water. Hence the reason for employing distilled water, or water that has been boiled and filtered.

¹ See "A Developer for Producing Prints of Exceptional Beauty," November, 1917.

Preparing Oxalate of Ammonium

Dissolve half a pound of oxalic acid in four pints of distilled water that has been raised in temperature to about 130° F. Stir with a glass rod or strip until all the acid is dissolved. Use a stoneware pitcher or crock in making up this solution. Then filter the solution through a plug of absorbent cotton placed in a glass funnel. When filtering allow the liquid to fall into a clean stoneware jar or crock of a gallon This is necessary because when making the oxalate the liquid rises through effervescence. As soon as the filtering is complete pour a little warm distilled water into the funnel. This will wash out the remaining oxalic acid.

The solution thus made will nearly approach a saturated solution. this jar and its contents into a moderatesize saucepan, upon two strips of wood; this will keep the jar from resting too closely upon the bottom and allow the water to circulate. Now fill the saucepan about half way with water; bring this to boiling-point; then add to the hot oxalic acid solution, gradually, some powdered carbonate of ammonia. (This article can be procured from any wholesale chemist.) The addition must be made in small quantities, owing to strong effervescence caused by the liberation of carbonic acid gas. must be also taken, at the same time, to avoid breathing this gas.) Stir the liquid well between each addition of carbonate, which must be continued until no effervescing takes place, when the jar may be removed from the saucepan and stood aside to cool. The crystals of ammonium oxalate will quickly form and continue to do so until the liquid has become quite cold. The water around the jar may be kept boiling gently during the whole operation.

When the jar has stood for about twenty-four hours, the clear liquid must be poured off into another jar, or into a large earthenware evaporating dish or basin, and placed in a warm room or closet to allow the remainder of the crystals of ammonium oxalate to be formed. As soon as the first crop of crystals have been obtained and well drained they may be spread out upon clean, white blotting-paper to dry, and when dry placed in a wide-mouth bottle,

well corked, ready for use.

If these directions are followed it will be impossible to fail in producing ammonium oxalate suited for photographic use.

Making Potassium Oxalate.

When making potassium oxalate the same method of procedure is adopted: By adding carbonate of potash to the heated oxalic acid solution until effervescence ceases, or, in other words, when the oxalic acid solution has become neutralized. It is set aside to cool, to permit the crystals of potassium oxalate to form, and treated in just the same way as for ammonium oxalate.

Sodium Oxalate

This salt is made upon the same lines as described for the ammonium and potassium oxalates, employing carbonate of soda in place of the previously described salts, and treated in the same way to obtain crystallization. The sodium salt, however, is not very soluble in cold water, and therefore is not suited for photographic purposes, although a developing agent may be made with it, but not of the quality that the ammonium salt gives.

Preparing Ferrous Oxalate

The preparation of this chemical in moderate quantity may be carried out

by the following directions:

Dissolve two pounds of protosulphate of iron in six or seven pints of warm water (not hot). As soon as the crystals are completely dissolved, filter the solution through absorbent cotton in a glass funnel. Dissolve; also, one pound of oxalic acid in the same quantity of water; then filter in like manner. When the solutions have become cold, or nearly so, add the acid solution to the iron solution. Stir these well; then stand aside to permit the yellow precipitate to settle, which will require about two or three hours. Then pour away the clear liquid so as not to disturb the precipitate. Fill the vessel again with clean water (ordinary tapwater will answer the purpose for this washing); stir the precipitate well; allow to settle; pour this wash water away. Give it the same treatment again. Then place the precipitate into a strong filter-paper with a piece of absorbent cotton placed at the apex of the filter-paper. This will straighten the filter at this part. Rinse the remaining precipitate from the jar; add this to the contents of the funnel; give two more washings of clean water in the funnel; allow this to stand for twentyfour hours. Then turn the contents of the funnel out upon heavy, white blotting-board to dry spontaneously.

The powder thus formed is ferrous oxalate, which may be used in making up any oxalate developer. If the handling has been carefully conducted in every operation there will result one pound, four ounces of pure ferrous

oxalate.

ARTISTIC LIGHTING

By FELIX RAYMER

S promised in my last article (page 505 of this Magazine for December, 1917), I have selected a few different effects in lighting for illustrations for use in connection with this article, all being made from one lighting

of the subject.

Number 1, the first of the series, is the lighting that ninety-nine operators make ninety-nine times out of a hundred. We refer to it as the plain lighting, or, as it has been styled in latter years, the

portrait lighting.

My claim is that this is the foundation of all other effects in lighting. All others spring from it, and unless this effect can be secured at will from every sitting and lighting none of the other effects may be depended upon to be correct. This statement may seem narrow, but when considered and tried a few times its truth

will be appreciated.

In securing this basic lighting, as I have before said, it is an absolute necessity that the light fall on the subject from the right direction. And to recapitulate briefly, that direction must be from a point in the light that will be neither from the top nor the side of the subject. If it comes from the top, the result will be a flat, hollow-eyed, sunken-cheeked monstrosity. If from the side, the result will be no better, although of a different nature, this time lacking in gradations, the light side of the face being lighted the same from the top to the bottom, while the shadow side of the face would be of one tonal value, very monotonous to say the least. In either case it would be an absolute impossibility to get what the old operators called "round lighting;" and just here I will add that I think the young operators will do well to cultivate the acquaintance of these old operators, for it is this "round lighting" that is artistic. In examining some very old daguerreotypes recently I was much impressed with the beauty and artistic qualities of their lighting. It was all that could be desired by the most exacting, and equalled by but a very few

operators of today. It is true that in the day of the old daguerreotypes the operators made but one effect of lighting, and that is what we are today calling the portrait lighting. They never moved the camera or the subject so as to get a different effect, but they worked with the idea of getting roundness. work shows that they had a full understanding of the situation and a knowledge of how to secure the results.

In the illustration we first notice the highest lights on the face. The highest comes on the forehead, next to the side from which the light falls, and then blends downward over the bridge of the nose, there being but a very trifling difference in intensity of light on nose The next "point" of and forehead. light comes on the cheek bone, next to the light. This high-light is of the utmost importance, from the fact that if the head is turned too far from the light to get it right on the rise of the cheek bone (I mean by this it must be exactly on the rise of the cheek), it will be thrown around farther on the cheek and will destroy the scheme for lighting for two reasons: first, for the reason that it will illuminate the rear of the light side of the head more than the front. This should never be. The front of the head in portraiture is the important part and is the part of the face that we wish to hold up to the attention of one looking at the portrait. To accomplish this we must put it in light, so that it can be seen. If it were placed in shadow it would serve to subordinate and retire it from attention. We never attract attention to any part of the picture by placing it in shadow, for if we were to try to do so we would only succeed in covering it to such an extent that it would recede from our To make anything stand attention. up so as to bring the attention of the beholder to it, in photography, it must be done, as in nature, by having it in light. If we were intending to do something that we did not want all the world to know, we would do it in the dark, not

in the light. So it is in making pictures. If we wish to show something we show

it in light.

The second reason for not getting the light too far to the rear of the face of the subject is, that if this light be placed too far back on the cheek a shadow will be thrown just in front of it, and that shadow will rest on the cheek bone, where the light should be. In doing so the cheek is thus made to have a hollow appearance that will cause the subject to look many years older than in reality. Now, we all know that this would never do, for this is a trouble we meet more often than any other. Our customers complain that the picture looks older than "I do." How many times have my readers heard this assertion? In many cases this is the reason for their making it.

The next point of light comes on the upper lip, just above the mouth, and this light is of importance. It aids in giving the mouth shape. If it were omitted the mouth would not show whether the lips were full, narrow, thin or thick, and many other questions would come in for

consideration.

The next point of light is on the chin. This is important in that it defines the shape of the chin, whether round, square, narrow, long, and so on. Every point of light and every shadow in the picture serve a purpose. To sum it all up in short order, the light is for the purpose of accentuating some part of the face or figure, and the shadow is to subordinate some part. If used in this way and with this idea constantly in mind, we will have but little trouble in attraction and subordination.

The last point of light I will call attention to is the one on the shadow side of the face. It will be noticed that it is very much weaker than any of the others. This I many times refer to as a half-tone, for the purpose of distinguishing it from the other, and will do so in this paper. Now, nearly all other considerations of this plan of lighting rest on this half-tone. It will determine the results of the forthcoming picture in ninety-nine cases out of a hundred. I place greater stress on this one point in giving my demonstrations than on all others, for the reason that the student can "take

it in" more easily than any of the other points.

If there is no half-tone on the shadow side of the face, it shows that the face has been turned too far from the light.

If this has been done there will be too

little light in the shadowed eye.

If there is not enough light in the shadowed eye, the catch light will be missing.

If there is not a catch light in the eye, it will be so low in tone that it will not show whether it is a light or dark eye.

If it does not show whether it is a light or dark eye, it will not be in harmony with the light eye, which does show the tone.

If the face is not turned far enough toward the light to get the half-tone on the shadow side of the face, the high-light on the *light* side of the face will be thrown too far to the rear and the *face will be illuminated too strongly on the rear*, as before mentioned.

Thus it will be seen that nearly all our failures are due to a lack of appreciation of the importance of the *shadow side* of the face and not the light side, as so many seem to think.

My reason for devoting so much space to the consideration of this one effect of the light is that it is of more importance than any other effect, if this plan of lighting is to be followed out. On the correctness of this effect all others depend.

Now we will look at illustration No. 2. Here we have quite a different effect in the lighting, and yet so slight a change was made in obtaining it that one would think it hardly worth considering. The only change was in moving the camera farther from the light than in No. 1. In the first case the camera was standing just half the distance from the light that the subject was posed. Remember that the size of the light makes no difference. It will be as good in a small opening as with the large opening, or vice versa; but get it falling on the face from the right direction. Don't forget this.

In making No. 2 the camera was placed just twice the distance from the light that the subject was posed. In moving the camera so far away from the light we will, of course, be on the shadow side of the face and viewing it from a

much different point of view, hence the different effect of the light, It is like moving around a house. We change the point of view and the effect of the light, but one view is as good as another. We do not change the house to get a different view of it, and there is just as much sense in changing the subject. Change the camera.

the lightest of them, for the reason that we are on the shadow side of the face and the light side does not show, but the effect is different, although made from the same sitting. In this case the light runs somewhat more down the front of the face than in the former examples, but is nevertheless made from the same sitting.



The "points of light" are the same as in No. 1, only we are viewing them from a different angle; so it will not be worth while to enumerate them again.

In No. 3 we have another view of the same lighting, only in this case we are still farther from the light with the camera, and in fact so far that the position is that of a profile. The "points of light" are the same, only we do not see as many of them, and in fact do not see

In No. 4 I have departed somewhat from the idea as mentioned previously, but for only one reason, and that is to show that it makes no difference what change is made after the direction of the light has been obtained. So long as it is not changed the lighting will be all right. In this example we have a full profile. The lighting was made just as in No. 1, and then the subject was directed to turn away from the light until all of the light

was off the nose, then stopped. The camera was moved around from the light until it was the exact distance from the light that the subject was posed, and this placed it in such a position that the profile was the result. It will be seen that the highest light is on the rear of the head and that it grades off across the cheek until it blends into the shadow of the nose.

In No. 5 the change was made to have the subject turn still farther from the light, in fact until all of the light left the face. This time it will be seen that the entire face is in shadow. The strongest light comes on the back of the head and stops at the ear, the balance of the face being in a soft, delicate shadow. The camera was, of course, moved farther away from the light than formerly, and in fact moved until a full profile was obtained, as in No. 4.

In No. 6 we have an example of what is known as the line lighting, which pro-

duces a very pleasing effect. To obtain it the subject is posed as in No. 1 and then directed to turn the head away from the light until all of the light leaves the shadow side of the face. In other words, it is an effect that does not have the halftone on the shadow side of the face. After reaching the point where the light has left the shadow side of the face the camera is moved around to that side of the figure until a full profile has been obtained, when it will be seen that there is no light on the face, except a narrow line that runs from the top of the forehead down toward the chin. lighting, or rather should I say position, will require a more perfect profile than any other that I know of.

All of these examples were made expressly for the JOURNAL, and to illustrate this article. The subject was posed for No. 1 first and the changes made as described in the article.

A SCORE OF PHOTOGRAPHIC PROVERBS

Never look a gift camera in the lens. A plate in the hypo's worth two in the slide.

It is better to have snapped and failed than never to have snapped at all.

All's well that prints well.

Where there's a subject there's a print. It's a bad plate that has no remedy. Intensification is vexation, reduction

is as bad.

Diffusion is the better part of art. An exhibition print is not made in a

What's worth taking at all is worth mounting.

A little hypo is a dangerous thing. The proof of a negative is in the printing.

Cut your print according to your subject.

He that takes what he does not want must often want what he cannot take.

Every developer has its day.

Take care of the negatives and the prints will take care of themselves.

There's many a slip 'twixt plate and print.

Never count your negatives before they're exposed.

Take much; print little; frame less.

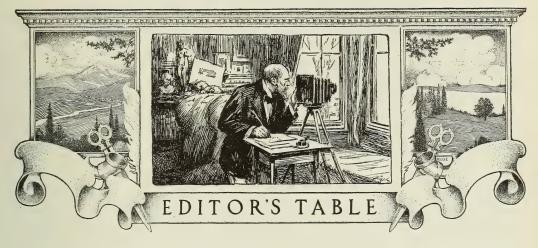












A PERSONAL WORD FOR THE NEW YEAR

MAN can give you what he has in his heart—no more. What I have in my heart is yours on New Year's Day and on each succeeding day. A sincere wish that you and happiness and prosperity may become an inseparable triangle in 1918.

May the New Year be full of the joy of *living* for you, and, perchance, sacrifices must be made, may yours be the nobleness of bearing them bravely. May your eye be keen enough to see, your ear to hear and your mind to grasp those things which will enure to your benefit and add a meed of happiness to the lives of those you love.

T. C. W.

THE YEAR 1917 AND BEYOND

HEN one has scrambled and fought and tugged to the summit of a "hill-top," he expects to look back upon the scene of his efforts and review it with a feeling of satisfaction and complacency which is only rivalled in its enjoyment by the beauty of the scene beyond and above him. We think, as photographers, that we all stand very much in that position now. The past year has been accompanied by a good deal of hard work for us, and now that we are almost at the end of it—or, to keep up the figure, at its top—we can look back upon it with a

feeling of relief, with somewhat of the victor's sense, thankful for what it has taught us and given us, and hopefully ready for the onward and upward climb standing before us for 1918. Before we go on, however, it may profit us to look down upon the pathway of the past year and gather for future use, briefly, a few of the good things which met us on the way, and many of which we may have overlooked altogether in our anxiety to be ahead.

The year 1917 has been one of promise and prosperity. The fact that this country is at war is no reason for any slump in conditions. If anything the change should be for the better. Throughout the country the best business intellects foresee nothing but continued and immense development.

The Government at Washington has organized a tremendously active and efficient photographic department, introducing methods and systems which are sure to be applied later to all branches of commercial and industrial photography and bring changes vital and beneficial to every photographer in the land.

There has been some talk of "retrenchment," "economy," and so on. But war-time is no time to talk depression. Indeed, with many billion dollars being spent by our Government and many more billions by the Allies in this country, it could be a difficult matter to stave off prosperity.

Business will be what we make it if we keep things going with the push

(21)

and energy characteristic of America and Americans. If we buy what we want when we need it, taking the precaution to make every dollar count by securing maximum value for every dollar spent, encouraging business, we will have absolutely nothing to fear.

War of itself does not necessarily mean business depression. A policy of injudicious economy and retrenchment will, however, create a depression, and in that event we ourselves will be wholly

responsible.

Photographers, as a rule, have had better business and have made more progress in their work than during any one year for several years back. Prices are firmer and often advanced, and the quality of work is of a grade sufficiently high to secure such a happy condition without murmuring from the public. The average photographer respects himself a little more, and where it is genuine, backed up by superior results, his patrons also respect and honor and confide in him.

And all this is as it should be, for if there is any class of men and women who should be self-respecting and respected it is that class whose mission it is to perpetuate the human figure. Everything, therefore, it seems to the most acute observer, looks prosperous for photography, and inspires us all with courage to go on upholding the honor of our profession and with keeping its head up among the highest of the arts and the most useful of the sciences.

MODERN BUSINESS METHODS IN THE STUDIO

NE of the most interesting and promising signs of the times from the view-point of the professional photographer is making itself apparent. This sign of promise is to be read in all parts of the country in the increased attention that is being given to the development of what may be termed the purely business end of the photographic problem.

Technic, we all know, is most important in any craft, but if all effort is devoted to perfection in the mechanical manipulations requisite to the production of any article of commerce, its sale or the demand for it will naturally When, therefore, workmen in any branch of business turn their attention to creating or fostering a demand for their products, they begin to grow and to widen their field of usefulness and profit materially. Every effort that is made to widen the territory over which their goods circulate brings new and valuable information concerning the condition in that field. A better knowledge follows of what the trade demands and of how to meet the require-

ments of the occasion.

The professional photographer in general has for many years not troubled himself much, if any, with questions of business of any kind, excepting such as were intimately concerned with the inside work of his studio. He has attended diligently to the turning out of such work sent his way and then, in many cases, at least, has contented himself with waiting for more. Meantime, however, new forces have been quietly at work, and the conditions that have not already changed are rapidly doing so all over the land. These changes began to make themselves visible some years ago when the old established gallery, which for years had done all or nearly all the photographic work of some prosperous community, waked up to the fact that its business was falling off and going to the establishment of some new man. He, while turning out work of perhaps inferior quality from an artistic or technical stand-point, nevertheless knew how to keep himself prominently, favorably and frequently before the public. The past few years have seen many good workmen pushed out of the field by less competent photographers who were, however, endowed with the business faculty that enabled them to create business for themselves, where none had been before.

As the situation is becoming clear and photographers are realizing as they never have done before that they must adopt modern methods of business in their studio and conduct their work on the same lines that alone make other business profitable, the outlook of the professional photographer improves.



PRACTICAL PAPERS ON STUDIO WORK AND METHODS

Clearing Up

It is customary at the beginning of the year either to resolve to do certain virtuous actions, or, what is even easier, to exhort others to do them. We hasten, therefore, to disclaim any connection to be existent between these remarks and the current date. Our present notes are apropos of the fact that our readers have just got over the "Christmas rush" which all pho-tographers are supposed to have to meet, and are commencing the quietest season of the year. In big business there is, or should be, a proper stocktaking resulting in a carefully priced inventory of the contents of the establishment, which, besides its immediate value in helping to show the photographer how he stands, is uncommonly useful in case of fire or burglary, since such stock sheets, preserved from year to year, will generally be accepted by insurance companies as giving an accurate statement of the quantity and nature of the stock apart from its market value. In many cases, however, it is not thought worth while to take stock, and in consequence, except in the smallest estab-lishments, there is often a serious accumulation of oddments of material which are rapidly deteriorating, and unless promptly used will be absolutely wasted. Nor is it in the direction of materials alone that loss may be expected. Various pieces of apparatus, even costly lenses, are often laid aside, and if ever wanted are found in a hopelessly damaged condition. What we advise is a rough stock taking of all mounts, plates, papers, and materials, seeing that everything is properly rewrapped and labelled and then placed in a readily accessible position. It is often found that a packet or two out of a big batch of mounts gets separated from the bulk, placed perhaps behind another kind and forgotten. A new pattern is ordered in and the old style discontinued, the hidden packets not being discovered until they are too old-fashioned to use for anything but packing. This is a loss which would be avoided if every shelf was examined at least once a year; then it would be easy,

while specimens of the style were still in existence, to bring them under the notice of customers until the "remainder" was used up. The saving effected may be inconsiderable, but it must never be forgotten that all losses go to reduce net profits, and a loss which is only a small percentage of the turnover is a large percentage when compared with the net profits, or, as a certain cash register advertisement puts it, on many lines every dollar taken from the customer is apportioned thus: Wholesaler, \$3; trade expenses, such as rent and taxes, wages, light, advertising, etc., \$2.50; profit, 50 cents; and that all losses owing to errors, dishonesty, or waste have to come out of that last 50 cents. Fortunately photographers do not work on so narrow a margin, but the principle is the same, and must not be lost sight of. These things are not so likely to occur when the photographer practically does all his own operating, but when an operator is employed, and especially where from some cause or other changes have to be made, there is more danger. In one case which came under our notice a new operator with a liking for tidiness unearthed more than \$25 worth of large plates, of the existence of which the proprietor was ignorant, from the depths of the dark-room. previous operator did not care for this particular brand, and had put them out of sight so that his pet make could be procured, heedless of the loss to his employer.

As with materials, so it is with apparatus. How many valuable lenses have been injured by being left upon a shelf in a damp place until the mounts are corroded and the surface of the glass rusted. We have actually known a large anastigmat to be ruined by being left upon a shelf under which the stripping of negatives with hydrofluoric acid was frequently performed; the outer surfaces were reduced to the condition of ground glass. Extra dark slides, front panels, and inner frames also suffer severely from improper storage, and, what is often very inconvenient, cannot be found when badly wanted. All this might be avoided, and probably would be, if the staff knew that the proprietor was

likely to make a descent upon the working quarters at any time. "The master's eye does more work than both his hands," and vigilant supervision makes for economy in many ways.

In most dark-rooms there is a considerable waste of chemicals through retaining them in the paper wrappers instead of transferring them to bottles. We have seen 28 pounds of sulphite lying open under the sink for weeks, although an air-tight jar provided for it stood empty a foot away, while instances of similar happenings with more expensive chemicals, such as ferricyanide, persulphate of ammonia, and bromides are too numerous to mention. If none of these remarks applies to the reader he is to be congratulated, but we fear that this will not be the case with the majority of photographers, who are distinctly of the happy-go-lucky temperament. Nevertheless, 'it is never too late to mend," especially when the process is so easy and so productive of good results. We do not for a moment wish to suggest that the clearing up should be only an annual function. It might well be done monthly or at any slack time. The good housekeeper "turns out" all her rooms weekly. In how many photographic businesses does this happen even to the reception room?—British Journal of Photography.

Don't Criticise Your Customers

You would naturally think that any one in business for himself, or working for any one else, would not criticise a customer. It would be a bad business policy, and you say you have never

Perhaps not intentionally, but you may have done it when you criticised the goods or the price of the same which he has purchased from some one else. As a salesman you step in and shake hands with the proprietor, and in a few moments your heart goes down to your boots when you see he is already supplied with the goods which you had hoped to sell him.

We have been there; we know just how you feel. Incidentally and some times accidentally, before you are through with him, you mention the fact that he has paid too much for those, and perhaps show him something at less price which you believe is just as good. When you suggest for a moment that he has paid too much for the goods, you are criticising his judgment.

As a photographer, you step into your reception room; a customer comes in asking the price of pictures, etc.; you show your samples; you give prices, and you soon learn they have had pictures taken at another studio at a certain price. We heard one man remark, "He makes good pictures for the money. You get all you paid for," which was simply criticism of the

customer's judgment of the pictures.

Any person who is selling goods should have all his time so completely occupied that he could not spare moments to mention his competitor's goods or prices. We know salesmen who have run down competitor's goods after they had already been sold, thinking he would get the orders the next time or on his next trip; but he found to his sorrow that he was not cheerfully received, and that there were no orders waiting for him. Even if what he said about his competitor's goods were true, he criticised his customer just the same. You can make sure that your customer will find out whether he had paid too much or whether the goods are not up to the standard without your saying a word about it.

Fault-finding and criticism are easy for all of us; but first try and put yourself in the other fellow's place, study the situation and all that he is up against, and before criticising see if you could do any better in the same place. Sympathizing with a customer, whether he be a special friend of yours or not, is criticism under another name. The time is soon coming in every business, large or small, where one or a thousand men are employed, when competition will be so great that in order to hold a position he must devote every particle of his energy and his talent to his own work and never for a moment think of what his competitors are doing, except to watch carefully the output of their factory or store and see if they have any goods that are better than his .- Ohio Photo News.

Conversation in the Studio

Every photographer who aspires to get something more than "the usual thing" into his portraits must endeavor to get the feeling of the sitter's character into his pictures, but doing this is not an easy matter. We all know how most of the delightful characteristics of our sitters vanish directly they enter the studio, and a strained and somewhat artificial manner comes over them. This, if the pictures are to please operator or sitters, is to be avoided at all costs. Many operators do not realize the real value of the right kind of conversation while the preliminaries are being arranged, not only in putting our sitters at their ease, but also in making the best of them as regards expression. If we know our sitters, this is fairly easy. Take the case of a male sitter of a rather commanding appearance: To get the most effective result he must give an impression of strength of character, even of hauteur, yet this is most often the type of sitter that a photograph frequently belies. Talk of some subject upon which you know him to be keenly interested, and then perhaps venture a slightly different opinion. Watch his expression, and release your shutter. With a male operator the ladies present a more difficult problem in this respect, as such a procedure as that indicated above may be very seriously resented. A hard, nervous expression, however, will in many cases rapidly melt away upon bright, cheerful conversation upon such a subject as flowers, or even children, music, etc.; and, for this reason, it is well to have these valuable accessories in a pictorial or actual form in the studio, ready to switch the conversation on. In fact, there is no such valuable attribute to an aspiring operator as a broad and varied outlook on life, and an intellect capable of attempting varied subjects of conversation. If the points noted above are put into practice, then the results will rapidly be evident in the increased success of the operator's productions in this respect.—British Journal of Photography.



The Annual Pittsburg Salon

The Fifth Annual Pittsburg Salon of Pictorial Photography will be held in the Department of Fine Arts of the Carnegie Institute, Pittsburg, Pa., March 4 to 31, 1918, inclusive.

All prints submitted will be passed upon by an impartial and thoroughly competent committee of selection. Prints possessing the highest merits in artistic expression and execution will be hung.

The Pittsburg Salon is distinctive in its annual exhibitions, being held in the spacious galleries of the Carnegie Institute, which surpass any other ralleries.

Entry blanks, containing full information and conditions of the Salon, may be obtained by addressing: C. E. Beeson, Secretary, 700 Union Arcade, Pittsburg, Pa. Last day of entry, Monday, February 11, 1918.

The Trade Review

PROBABLY the most important item of interest in the photographic business at this time is the matter of manufacture and distribution. War restraints and the very unusual conditions arising from it affect all business lines, ours included, and they serve as a handicap to the even and unrestricted flow of trade.

The manufacturers are face to face with a shortage of raw materials, of labor and of rapid transportation. The condition of the raw material market is reported to us as being most complex. Certain articles are almost impossible to obtain, and these are essential to the production of a large number of the materials used in photography.

The labor situation is not good, on account of so many young men being called to the defense of the country, and, furthermore, certain kinds of skilled labor are required for government work and must, therefore, be withdrawn from the production of such goods as are used by the trade generally.

Photography has become a very essential part of war, and the government requires, and will continue to require, a very large quantity of lenses, cameras, plates, films, papers and chemicals. When a manufacturer is called on to supply these things, the war orders must be

given the preference in every stage of manufacture and delivery. The best labor is assigned to that work, to the exclusion of the general trade, and if certain materials are scarce, the government is supplied first, while the public will be served if there is any left. For instance, optical glass is scarce, and skilled workmen are limited in number, and when the tremendous demands for binoculars, range finders and lenses of various types are known, it at once becomes obvious that if the demands of the government are to be supplied, there will be scant leavings for distribution through the general trade. Our country and our allies require supplies, and their requirements must take precedence, even if it means that we all lose sales and business.

In the matter of supplies, the government is finding a sudden demand for large quantities of x-ray plates, to mention just one item. Each and every hospital for the army sick and wounded is furnished with a machine, and where the life or welfare of a soldier is in question, there is no holding back of any supplies or work to save life and limb. The x-ray plates must be supplied, and, as they are of special speed and quality, they require the attention of the best brains, labor and machinery. Thus the material, labor and machinery are taken from the supply for ordinary purposes and concentrated on the government requirements. And so we could go on repeating examples to illustrate the conditions, but these are enough to enable the public to understand why it is impossible to supply some goods with the regularity that we have been accustomed to.

An additional aggravation is the transportation situation. Whether it is the heavy traffic, the shortage of railway labor and equipment, the lack of system or the intention of the railroad management to exaggerate conditions for the purpose of furthering their own ends, we are not able to state with any degree of certainty. As a matter of personal opinion, we are inclined to believe that it is a combination of all of these causes. At any rate, the situation is utterly abominable and almost unbearable. Service that heretofore could be depended upon with some degree of regularity, is so demoralized that there is absolutely no means of calculating when goods will be delivered. A normal three-day

service now ranges from six days to a month, with the chances largely in favor of a shipment being split up and a portion of it lost, strayed or

stolen.

It is natural that each business man should fancy that he is subjected to more annoyance and loss than any one else, and, believing this, we have taken the trouble to make inquiries among merchants in other lines, and we find that the photographic trade is far from being the worst. Our business delays and disappointments are quite below the average, with one very vital exception. Manufacturers and dealers in other commodities have made use of the flunctuation in price, and, as a rule, have enjoyed a larger margin of profit for that reason. Photographic merchandise has maintained a more even price level than any line that we recall at this writing, but the profits have not increased either and extra profits are not enjoyed to compensate for the delays and inconveniences of supply.

As for the outlook, we confess that we do not see much chance of immediate improvement nor anything to be gained by protest or complaint. The manufacturers will require time to adjust their supply of raw material and manufacture to the new conditions. The railroads will be expected to improve their service. The dealers must calculate on the probable consumption in their territories and buy accordingly. That these severe requirements will be met without mistakes or miscalculations, is scarcely to be expected, but if the mental attitude of everyone in the business is one of cooperation instead of obstruction, it will be found that substitutions will take the place of desired merchandise, and business will go ahead at its present activity. If we cannot have everything that we want, we must console ourselves with what we can get, and by accepting that cheerfully we will be doing our bit and more than likely we will not fare so badly, either.—Trade News.

Wake Up

Aren't you surprised when you wake up and find yourself filled with ambition and energy! How many years or months have you been asleep? One critic of salespeople and people who work in the factories stated he believed 75 per cent. of the people of this country are asleep half of the time. When anyone says, "I have done this for twenty or thirty years and the same mistakes occur," you may be sure he or she is asleep and doesn't know it.

There are many ways of awakening, change of department, surroundings, associates, etc. A RUT is mighty hard on a traveler when he wants

to make any headway.—Topics.

Death of William Hall Walker, Kodak Pioneer

WILLIAM HALL WALKER, former head of the Kodak, Limited, of London, and until his retirement a member of the Eastman Kodak Company of Rochester, died November 29 at his home, New York, in his seventy-second year. Mr. Walker was born at Scio, Mich., and received practical training as a mechanical engineer, becoming in later life the patron of several technical institutions, among them Stevens Institute,

to which he donated \$100,000 several years ago, and the Mechanics Institute of Rochester, to

which he gave \$25,000.

Mr. Walker devoted much time to the development of photography and was the inventor of many devices which helped bring the art to its present degree of perfection. He became the European representative of the Eastman Kodak Company, with headquarters in London, where he was a prominent figure for twenty years, until his retirement twelve years ago. He was a member of the Camera Club and the Royal Institute of London and India House in this city.

A New Method of Color Photography

J. M. Hammond, of Philadelphia, has on exhibition at the rooms of the Photographic Society of Philadelphia a new process for reproduction in natural colors in prints upon paper. The method is a great improvement upon anything previous in this direction, and is simple of operation.

The exhibition presents a number of prints from a variety of subjects, directly from nature and also from paintings and water-colors. The colors are close to the originals and of excellent

interpretation.

An Exhibition of Pictorial Photographs by Frances Benjamin Johnston

MISS FRANCES BENJAMIN JOHNSTON gave an exhibition of photographs of "Gardens East and West and Other Studies" at the Touchstone Galleries, New York, from December 3 to 15, 1917. As might have been expected of an artist of Miss Johnston's experience and skill, this exhibition was one of the most notable of its kind ever held in New York.

The collection embraced morceaux from Long Island, Connecticut, and Rhode Island in the East, and, in the West, Burlingame, California, San Mateo, San Francisco, Piedmont, Montecito, Santa Barbara, and Pasadena, and included the estates, among others, of James L. Breese, Parrish Art Museum, George W. Wickersham, Cass Gilbert, Mrs. J. H. Moore, Myron Hunt

and Herbert Coppell.

There were fifty-nine pictures in all, 14 x 17, printed on beautiful Artatone, skilfully worked. A few were out of tone, showing too many light spots and obtrusive high-lights; but many had good or excellent tonal quality. Among the latter may be mentioned "Approach from the Drive;" "The Pergola Under Clematis Bloom;" "Entrance to Public Gardens;" "The Open Gateway;" "In Lilac Time;" "Columns and Pediment of Forecourt;" "Detail of Entrance;" "A Balcony;" "Detail, Forecourt;" "An Interior;" "Detail of Interior;" and "Main Façade" (Santa Barbara Mission).

The exhibition was largely attended and the

pictures greatly admired.

Thirteenth Annual Exhibition of Photographs, John Wanamaker, Philadelphia

You are invited to send your pictures to the Thirteenth Annual Exhibition of Photographs, to be held March 4 to 16, 1918, in Philadelphia.

Entries close February 9, 1918.

The judges will decide the merit of each picture as they would in an exhibition of paintings or sculptures, and will have authority to hang only those pictures that are worthy, omitting all others. Eighteen prizes will be awarded, and as many "special mentions" as may please the judges.

First prize, \$100; second prize, \$50; third prize, \$25; five prizes, \$10 each, \$50; ten prizes, \$5 each, \$50. In case of several pictures being of nearly equal merit, the judges may combine the prizes and divide them in different proportions, according to their judgment of the relative

merits of the pictures.

Exhibitors should take note that we hold two exhibitions each year: (1) The Popular Exhibition, in November, for beginners in the art of photography; and (2) the Exhibition in March, for advanced camera workers.

For further information, inquire at the Photographic Exhibition Bureau, Street Floor, Juniper Street, John Wanamaker, Philadelphia.

The American Annual of Photography, 1918

This popular and well-known Annual has come to hand, and we are pleased to note that in spite of the unusual conditions prevailing at this time the publishers have been able to maintain the same high standard and size.

The present volume, for obvious reasons. contains almost entirely the work of American photographers, and the numerous prints are most effectively presented, forming truly a collection of American work which is sure to be of special interest to all pictorialists. Many of the articles are timely and interesting, but do not convey or present any new information. Nevertheless this *Annual* is sure to be of value and interest to every photographic worker.

Geo. Murphy, Inc., 57 East Ninth Street, New York City, are the sales agents, and the price is, paper, \$1.25, and cloth, \$1.75.

The Middle Atlantic States Convention

Baltimore, Md., will play the host in a most auspicious amalgamated convention, beginning Tuesday, March 19th, next, and continuing until

the following Friday inclusive.

A. H. Diehl, of Sewickley, Pa., president of the Photographers' Association of the Middle Atlantic States, has been a visitor to Baltimore recently, and in company with Secretary William Kinling, President J. W. Scott of the Baltimore Section, and Charles J. Columbus, Secretary of the Photographers' Association of America, made a survey of convention properties and program possibilities, and have for the confirmation of the Middle Atlantic States Board at its meeting in January, selected Hotel Rennert as the convention headquarters and the big Odd Fellows Hall, across from the hotel at Saratoga and Liberty Streets as the scene of the convention and the exhibit.

No more prominent location could be secured in the Monumental City for this big gathering. Odd Fellows Hall is one of the most celebrated buildings in Baltimore and besides carries great

prestige in the State.

The lighting and acoustics of the assembly hall are absolutely ideal and afford a setting for the convention work that is not often found. The exhibit space is regarded as highly attractive. The convention hall and headquarters are right in the heart of things in Baltimore, a number of other hotels and the big shopping district being within three blocks of the location.

Pretty nearly everybody in photography knows, or knows of, President Diehl, and it goes without saying that the coming convention of the Middle Atlantic States will lack nothing in interest to establish it high up in the lexicon of big performances in the interest of photography. The program that President Diehl has planned includes demonstrators and lecturers of national prominence.

Celebrated men will be on the program for

the Better Acquaintance Luncheons, which will be a feature of the convention. George Harris, of Washington, D. C., has accepted President Diehl's invitation to take charge of the first

day's luncheon, March 19.

General Secretary Charles J. Columbus, of the Photographers' Association of America, is arranging for the presence at the convention of men high in the council of the nation.

The Baltimore photographers are planning for entertainment out of the ordinary. Baltimore is just brimful of interest and is fairly seething with real activity at the present time. One of the big entertainment features will be a trip to the celebrated United States Naval Academy at Annapolis. This will be made by steamer, in order to give the photographers an idea of the wonderful development of the munition industry in Baltimore. A luncheon will be served on the steamer, and the return trip made in time for dinner. A drill by the cadets will be one of the features of the trip. this water-trip will be held in March need have no terrors for convention goers. Arrangements have already been made for a steamer that will provide adequate vision of the waterfront with-out the terrors of the proverbial March gale.

As a matter of fact the March climate in Baltimore for years back has been found to be ideal. President Diehl has received assurances from all of the officers of the Middle Atlantic States that big crowds may be expected. The famous "Pittsburg Bunch" will be there in force and

with bells on.

Rexo M. P. Film (Raw Stock)

BURKE & JAMES, Inc., of Chicago, have just placed on the market a new motion-picture raw stock, known as Rexo M. P. Film, which is sup-plied in both positive and negative emulsions, perforated or unperforated as desired.

Rexo M. P. stock is a standardized product of an up-to-the-minute film manufacturing plant. Repeated tests prove that it meets every requirement of practical camera and dark-room men.

It has wonderful latitude in both positive and negative emulsions, and is characterized by the fineness of grain, the beauty and brilliance of

the pictures, and by the entire absence of the "chalky" high-lights and "sooty" shadows.

The negative stock has great speed, thus insuring good results even under adverse light conditions, while its wonderful latitude insures correct exposures with a wealth of detail under normal light conditions. Rexo M. P. stock is extremely orthochromatic (color correct), giving the correct photographic record of the relative brightness of colored objects as seen by the eye. This means beautifully gradated pictures full of detail in landscapes, foliage, flowers, etc., at the same time producing the correct atmospheric effect. It is exceptionally rich in silver, and produces clean, brilliant negatives of excellent printing quality.

Rexo M. P. stock can be successfully developed

by any standard M. P. formula.

It may be of interest to our readers to know that the Burke & James Company are by no means novices in the manufacture of film, they having placed on the American market Rexo Speed Film more than a year ago.

The company is also the sole wholesale distributors for the Universal Motion-Picture Camera.

Consolation for the Sleepy Man

THE photographer who fails to advertise is not called upon to sweep out his store so often in muddy weather. If you do not advertise it is quite likely you will not have to go to the bank so often to deposit your receipts. Having no advertising bills to pay usually results in fewer customers and you do not have to keep so many assistants. You have more time to yourself, because you can open and close when you like if there are no customers to wait upon.

Then again, if you do not advertise and do not do much business, you do not have to talk to so many salesmen and you do not have to

buy new goods so often.

Of course, there are other advantages that the non-advertiser enjoys, such as reading books while doing no business. It gives you more time, for the charity solicitors will pass you by if they think you are broke. You do not have to take regular gymnastic exercise; you will probably get enough dodging creditors.

The photographer who does not advertise usually plays the best game of checkers or dominoes, and it is seldom he makes a mistake in figuring out a bill. There is not much business

Surely many are the lesiure hours for the fellow who does not advertise, but what kind of a community wants him as a citizen?—Professional Photographer.

Inversion of Image by Sulphur-Dioxide

It has been found that the photographs taken at the top of a volcanic cone show positive pictures instead of negatives, and other photographs taken in the vicinity of the volcano were somewhat different from ordinary negatives, that is, they show a thick line on the contours of the mountain, of trees, and of their shadows on the surface of water. It was thought at first that the above changes might be attributed to some

radio-active substances in the volcanic region. On testing it was found that the lava gave out no radio-active rays. Photographs taken at sulphurous hot-springs show similar changes on the photographic plates. From these facts, it was suggested that a gas such as sulphur dioxide, which is often present in the atmosphere in volcanic regions, might have a certain action on the gelatin silver-bromide of the sensitive film and might cause the reversal. In this view the following experiments were carried out, the result of which shows that the photographic films of gelatin silver-bromide give rise to photoinversion by the action of SO2 gas, and may have positive or negative pictures if the concentration of SO₂ gas, the time duration to the exposure to the gas, and the intensity of the incident light satisfy suitable conditions. The concentration of SO₂ gas being constant, the degrees of inversion are different for different times of exposure. The time of exposure being constant, the degrees of inversion are different for different concentrations of SO2 gas. A positive picture generally appears in a wider range of the intensity of light and of the time of exposure to SO₂ gas, for the weaker concentration of the gas than for the stronger. There exists for photo-inversion the cumulative action between the exposures to the gas and to the light. The action of SO_2 gas gradually weakens with time and disappears generally within several hours. Photo-inversion closely resembles solarization in the change Photo-inverof grains in the film.—H. SAEGUSA, in Proced. Math. Phys. Soc., Tokyo.

Photographic Subjects in Leading Periodicals

"The Production of Scientific Knowledge," by C. E. Kenneth Mees, Science, November, 1917, p. 519

"Some Points in Strip Printing," by M. Levy, British Journal of Photography, 1917, p.

"Regression of Image on Development Papers of the Character Used for Portrait Work," Portrait, October, 1917.

"Fog and How to Deal With It," Studio Light, November, 1917, p. 6
"Flashlight Portraits," British Journal of Photography, 1917, p. 541
"Depth of Field in Cinematography," by A.

Lockett, British Journal of Photography, 1917,

p. 546
"An Interesting and Economical Process of Photographic Printing," by R. Namias, Il Progresso Fotografico, 1917, pp. 208-238.

"Concerning the Lens Hood," by J. Thomson, *Photo-Era*, 1917, p. 221.

"Efficiency for Motion Picture Studios," by C. L. Gregory, Moving Picture World, Novem-

ber, 1917, p. 698.
"Practical Advice for Camera Men Bound for the Front," Motion Picture News, November, 1917, p. 3504.

"The Camera Man's Job," Moving Picture

World, November, 1917, p. 698. "The Most Wonderful Sensitive Material," by C. E. K. Mees, Kodakery, November, 1917, p. 23.

Replies to Inquiries

THE principal causes of the ammonium oxalate depositing are (1) due to a low temperature, and (2) the concentration of the solution. If the whole of the developer, made as per formula given, is re-heated, and eight ounces more water added, the difficulty will be lessened and in nearly every case disappear.

The acid fixing bath is quite unsuited to this developer, owing to its containing free sulphurous acid, which readily attacks the image. The best fixing solution for use in this case is plain hypo, as described. The alum bath after-

ward may be used or omitted; its use is to make the film nearly insoluble.

The various kinds of paper used were as follows: Azo hard; F glossy, single weight; Azo soft; Azo rough buff and Azo double weight glossy; Azo matt (carbon) and glossy Velox. Five or six minutes in the plain hypo bath is sufficient for fixing

Clean trays are absolutely necessary. Damp fingers will cause marking, which disappears

upon full development.

Important Corrections

In the November issue of the Journal relating to the article upon "A Developer for Producing Prints of Exceptional Beauty," page 461, line 26, from the commencement should read: "While potassium oxalate was another 'Foreign' product" in lieu of "ferrous" product.

In the article upon "Removing Films from Cracked Negatives," the Workroom, page 496, the word "Magos" should read "Magno,"

signifying to magnify or to enlarge.

The ammonium oxalate developer recuperates somewhat when exposed to white light, which aids the solvent action of the oxalate upon the small quantity of oxide of iron formed by the exposure of the developer to the air during development of prints. This action is the reverse to that which takes place in an alkaline developer. A few grains of tartaric acid added to a much used or oxidized developer and exposed to sunlight for a day in a white glass bottle will recuperate considerably by dissolving the oxide of iron formed. If an amber-colored bottle is used, no such action takes place.

New Kodachrome Color Process

In this new Kodachrome process a method has been found of transforming a silver negative into a dye positive. The negatives being made through the correct filters, they are bleached in a bath which transforms the silver into silver bromide and at the same time locally hardens the gelatin in proportion to the silver contained in the negative, so that the gelatin is hardest where there was most silver and remains soft where there was no silver in the negative. On fixing, the plate shows no sign of an image, but when it is put into the dye bath, the dye goes into the gelatin most easily where the silver was absent in the negative; that is, where there was least light in the original photograph or in the part represented by deep shadows; while in the parts corresponding to the high-lights, where there was much silver in the negative, the dye

penetrates more slowly, so that as the dye slowly enters the film, the original negative is transformed into a positive produced in a colored dye. While the one color is made in this way, the companion picture is also dyed in the other color, and the two when placed together make the

finished picture.

The process is thus seen to be simplicity itself, the novel point of it being the method which has been worked out for transforming a black-and-white negative image into a colored dye positive. Since only two colors are used in the process, it is obvious that all colors cannot be correctly rendered, and the colors for which the process fails are the blues, violets, magentas and purples. Light blues appear blue-greens, and violets, black; magentas appear pink, and purples dark brownish-red. On the other hand, flesh tints of all kinds, and all shades of red, orange or green, grays and blacks are well rendered. As these are predominant in portraits, the results are very satisfying for this class of work. Many of the pictures appear to show blues very well, but this is because, by contrast with greens, blue-greens look blue, and especially by artificial light the eye is accustomed not to expect very much of The failure in color rendering is more obvious by daylight, and because of the importance of greens and blues in most landscapes the process is not suitable for landscape work. The pictures appear at their best when placed in a special illuminator, giving a much truer color rendering than when viewed by daylight. The results obtained are permanent, the colors being fast both to light and heat.—C. E. K. Mees.

Get Your Cash Discount

DID you ever stop to figure out how much you could save during a year by discounting your bills? You may say that 2 per cent. of three or four dollars is not worth bothering over the tenth of the month and let the bill run until the end of the month. Perhaps it is only a matter of a few cents, but are not those few cents as good to you as they are to the other fellow? Moreover, multiply these few cents by ten or fifteen bills and soon you have a dollar or two which should be yours every month. If you dig into this matter you will find that ways and means may be found to meet your obligations promptly on the tenth of every month. Of course, we all have our times when money is mighty scarce, but everyone of us who values his business standing and his own income should make the effort to get all that there is coming to us by legitimate thrift. Credit in the business world is what we all need to make a success. There is no surer method of getting credit than by having the reputation of discounting all bills promptly. is without question worth the fight. If you discount your bills you have every right to expect your customers to pay you on time. they do not, you have the weight of reputation on your side which if rightly used will make your collections an easier proposition than if your customers can remind you of your own shortcomings. Try discounting your bills, you will find it pays in more ways than one.



WORKROOM

ONTAINING THE LATEST PROCESSES, FORMULAE AND APPLIANCES NEEDFUL IN THE ART OF PHOTOGRAPHY FOR THE OPERATOR & WORKER

REDUCING BROMIDE PRINTS DRY WITHOUT ABRASION MODELS FOR SPECIMENS PORTRAITS OF CHILDREN WITH A REFLEX CAMERA PLATE TROUBLES POINTS TO NOTE WHEN BUYING A LENS SECOND HAND TONING BROMIDE OR GASLIGHT PRINTS AN ECONOMICAL PYRO-SODA DEVELOPER IGNITING FLASH POWDER SILHOUETTE PHOTOGRAPHS WAR CHEMICALS METHOD OF PREPARING PRINTING SURFACE WITH MERCUROUS SALTS FLASHLIGHT HINTS MAKING A FOCUSSING SCREEN PINHOLES IN PHOTOGRAPHIC PLATES A NEW METHOD OF INTENSIFYING NEGATIVES SELF-PORTRAITURE BY FLASHLIGHT BLOCKING-OUT FILMS REAL CAUSES OF BLISTERS A SIMPLIFIED METHOD OF WRITING DEVELOPING FORMULAE FOG AND HOW TO DEAL WITH IT PHYSICAL REDUCTION FOR NEGATIVES FORMULA FOR COLLODION AND IODIZER SUITING THE PAPER TO THE NEGATIVE A USE FOR OLD BROMIDE PAPER How to Secure Good Color and Brilliancy in Toning Bromide Prints REVERSED NEGATIVES OR POSITIVES BY AMMONIUM PERSULPHATE STORING NEGATIVES WORKING COLLODION PAPERS PLAIN SALTED PAPER STRIPPING FILM NEGATIVES AN EXTRA HARDENER

EXPOSURE TIPS
REPLIES TO QUERIES



THE WORKROOM

By the Head Operator



Reducing Bromide Prints Dry without Abrasion

HITHERTO it has not been a practical proposition to attempt much in the way of local reduction on bromide prints, except in the case of large areas which could be treated with reducer while the print was wet, and those small blemishes which may be removed on the dry print by abrasive methods. The reasons for these limitations are that all the reducers recommended have been in watery solution, and if applied to a dry print are consequently liable to cause a surface mark. Moreover, if so used, even at the risk of surface marks, it is obvious such use must be extremely limited owing to the necessity of washing off after the first application. On the other hand, if used on a wet print, the reducer rapidly spreads, and its effect can neither be estimated with certainty nor can it be localized.

The recognition of these facts led the writer to the conclusion that if some reducer could be found which was soluble in alcohol or acetone, for example—some liquid, that is to say, for which gelatin has less affinity than it has for water, but one which quickly evaporates, and yet lasts sufficiently long and is sufficiently mobile to penetrate the film—these difficulties would vanish; and it would be possible to carry out reduction with a brush on the dry print to

an unlimited extent.

Methylated spirit naturally suggested itself as the most suitable liquid. Acetone, owing to the difficulty of obtaining it at the present time, has not been tried. Very few chemicals used in reduction are soluble in methylated spirit. In fact, the list consulted showed only two—iodin and potassium cyanide—and, as luck would have it, these are the very two chemicals one would have chosen. For iodin and cyanide together make an absolutely non-staining reducer, and one which has long been regarded as the ideal reducer for bromide prints.

Experience soon showed that a solution of iodin and potassium cyanide in spirit acted exactly as was anticipated, provided the spirit was not stronger than about 75 or 80 per cent. It was also found necessary that a little potash or ammonia should be present to prevent the formation of blue iodide of starch, which otherwise would result owing to the presence of starch in the paper. A satisfactory solution was

prepared as follows:

A

Potassium iodide 6 gr.
Rectified spirit 1 fl. oz.
This is practically the tincture of iodin of the British Pharmacopæia.

B

Saturated solution of potassium cyanide in pure rectified spirit containing about 25 per cent. of added water.

Cyanide is, of course, a powerful poison, and

must be treated as such.

C

Strongest solution of ammonia.

This is the s.g. .880 of the Pharmacopæia. All these should be kept in well-stoppered bottles.

The working solution is prepared as follows: One dram of A is taken, and B is added until the iodin is decolorized, and about as much additional B is poured in to make the cyanide in excess. Then half a dram of C is added, or sufficient to prevent the solution giving a blue stain on paper. The total quantity should measure about 4 or 5 drams—that is, the quantity of cyanide solution required will probably be about 3 drams for each dram of iodin solution. Cyanide, however, is of rather uncertain strength, and at present it is not possible to make the formula more definite than the above.

The solution must be further diluted with spirit in order to moderate its action for delicate work. Whether the mixed solution will keep for any prolonged period cannot yet be stated, but so far the mixed solution appears gradually to deteriorate. The solution should be water

clear and colorless.

The dry bromide print, which may be in blackand-white, or even sulphide-toned, is pinned to a drawing-board, and the solution applied with a suitable brush to the parts it is desired to lighten, the strength of the solution being reduced with a little methylated spirit for parts in which the gradation is very delicate, or which only

require extremely slight reduction.

The action of the reducer must be watched, and, as in some cases a few seconds only is the time required, there must be at hand—in fact, in the hand—a small bit of cotton or lint moistened with methylated spirit, which must be passed over the part the instant the action is seen to be sufficient, or rather, perhaps, slightly before it is deemed sufficient. This is followed by a wipe with a dry cloth, and the part is at once ready for a further application of the reducer, if required.—T. H. Greenall, in *Photography*.

Models for Specimens

It is not always easy for the photographer who wishes to produce specimens of a new style to find among his ordinary sitters suitable models who will allow their portraits to be used for such a purpose, and who are willing to give the

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time and trouble incident upon such sittings. It is, therefore, often desirable to reverse the usual order of things, and pay the sitter for the privilege of taking his or her portrait. This puts the photographer in the position of being able to command the sitter's services for a definite time, and to take such poses as he may desire without considering the model's ideas. This is, of course, the usual method of the brethren of the brush and pencil, and many professional models sit for both photographers and painters, although many consider photography as rather derogatory to their professional status. Another advantage of employing a professional model is to be found in the fact that there is a market for commercial purposes for good head and figure studies, and more than one photographer has found the practice quite a good-paying proposition. Models for photography may often be found among the humbler members of the theatrical profession. The chorus lady is not overpaid while "in a shop," and when she is "resting" the photographer's half guinea or even less comes as a welcome addition to her income. The advantage of theatrical models is that they have been trained to assume postures to order and have some idea of what expression is on their faces at any time, points on which the private sitter is very weak.—British Journal of Photography.

Portraits of Children with a Reflex Camera

In continuance of the description of his studio practice of using a reflex camera with a longfocus lens for portraits of children, Mr. Herbert Lambert, in The Amateur Photographer writes:

"I have said that I do not attempt to 'pose' my child models in the sense of forcing them to take up some preconceived position; the thing has to be done indirectly if it is to be done at all, and the first object always should be to get on friendly terms with one's little subjects, so that they can be quite spontaneous and natural. Try not to let them think anything about the camera; from their point of view this should be mainly a thing on which to stand toys and other interesting and amusing articles. If possible, I like to get them in the mood so that they will do most of the talking themselves. I do not want them to keep still, as if they did I should not be able to judge what was a characteristic position. When the right mood comes, then it is my business to watch quietly for my chance—it may come in a minute, or sometimes it may be a quarter of an hour before an exposure is made. Here is one of the points where the art of selection comes in; dozens of different photographs might be taken, all of which would, in a sense, be natural, and might be spoken of as good likenesses,' but this is not enough.

"Very much on the alert, one has to watch very quietly, keeping the image ready focussed on the screen—an occasional glance is enough for this. Presently, if the fates are kind, there will come a moment when position, expression everything seem to become typical of the very spirit of childhood. It may only last a moment, but this is where the reflex camera is so invaluable. There need be no delay; the exposure can be made at once without the child ever knowing that a photograph is being taken. If one is fortunate in catching this 'moment of life,' it always seems to me that the result is something more than just the likeness of the individual child; the picture becomes, in a sense, abstract, an idea—the idea of childhood as revealed through one particular child."

Plate Troubles

All troubles are not hot weather troubles and some of us forget from year to year the precautions made necessary with the coming of chilly weather and cold dark-rooms.

One of the most common plate troubles is the appearance on negatives of irregular semiopaque spots with blended edges. Such spots are easily avoided once their origin is known. They are caused by laying the film side of one plate against the glass side of another in removing exposed plates from the holders previous to development.

Plates, as a eule, are kept in a cold darkroom and it is natural for the warm fingers to come in contact with the glass side of the cold plate in removing it from the holder. The warm fingers leave spots of moisture on the cold plate. This is particularly true if the fingers have chemical impurities on them or if the hands are

naturally moist.

In placing the exposed plates in a box to await development the film side of one plate is placed against the glass side of another and the finger mark offsets on the sensitive emulsion and shows up in development. The spot is puzzling at first; but once the cause is known, placing the plates in the box, film to film and glass to glass, does away with the trouble.

To readily distinguish the box of exposed plates stick two strips of gummed paper on the cover

in the form of an X.—Photo Digest.

Points to Note when Buying a Lens Second Hand

When a lens is being bought for use it is often possible to effect considerable economy by getting a second-hand one. With modern patterns, such as recent anastigmats which are of current types, the saving is seldom very great, and it may actually be more economical to buy direct a new lens at full price from the maker so as to have his guarantee that the instrument is in perfect condition. But with the older types this is not likely to be so important, particularly when buying a long focus lens for a comparatively small plate. In such a case there is no great advantage in getting an anastigmat at all, since the old lens on the small plate will do the work as well, as rapidly, and perhaps at a tenth of the cost. To buy judiciously one must be able to make a simple test or two, and must know what to look for.

In the first place, the glasses must all be there. It is best to turn up some cross-section of the lens, such as is given in Abney's "Instruction in Photography," so as to know what to expect in number of glasses, approximate curvature, and position. There have been cases in which a seller has replaced a missing glass by a circle of window glass from the local glazier; and one

should know enough to detect this at once. When the presence of all the original glasses is assured, one should next see that they are in their correct position and then look to their condition generally.

Straining a Lens

An expression which is often heard is that of "straining" a lens. People talk of straining a lens by using one that is made for a 4×5 on a 5×7 , or by working at f/5 an instrument of which the largest aperture provided by the maker is f/8. In the sense that we are striving to do more with the lens than it was designed to do we are straining it; but the result of such straining will only show in the photographs obtained. The lens itself will be none the worse for it

In fact, a lens is one of the few appliances which are in no respect the worse for being used. No lens could be worn out with use; nor of two identical instruments would one which had been used to take a hundred or a hundred thousand photographs be worse than the other which had never been used at all. The lens mount might have got worn with handling, the cap might be lost, or the shutter worn out, but the lens itself should be unaffected. If an old lens is inferior to one fresh from the optician's workshop, it is not because it has been used, but because it has not been properly kept.

The greatest enemy of a lens is the cleaning it receives from time to time; and when one sees a photographer treating the accurately curved and beautifully polished surface of a modern anastigmat as Sir Joseph Porter treated "the handle of the big front door" it is impossible not to reflect that he does not know the harm he is doing. Some lenses are injured by being dropped on the floor, or strained in packing, or in the attempt to unscrew them; but the great constant injury which lenses receive day in, day out, is due to the cleaning they get, much of which is not merely improperly done, but is avoidable.

It is important to use a clean lens; but it is still more important not to clean it. The explanation of this paradox is that a lens should be kept clean by being protected from dirt, not by having the dirt rubbed off it.

In looking at an old lens with a view to purchasing it, the most important thing, therefore, after satisfying oneself that all the glasses are there and in place, is to see to what extent it has suffered by being cleaned. If a new lens of fine workmanship is examined it will be seen that its surfaces have a deep black look, the sign of the highest polish—the exact opposite, in fact, to the appearance we get when the surface is roughened by breathing slightly on it. A lens which keeps that black polish unimpaired has not suffered from rough or excessive cleaning. The best place to look for such injury is in the center of the convex surfaces, particularly the front surface. Closely examined, this will often be seen to be covered with a host of fine scratches, or at least to be perceptibly dulled. A lens in this condition will not give any worse definition than before, but the negatives obtained with it

will not be so free from fog. It may not be a reason for not buying the lens, but it is a good reason for getting it at very much less than the list price.

Change of Color in the Glass

There is another respect in which lenses sometimes suffer from age, and that is in change in the glasses themselves. Some old lenses, which have been freely exposed to light for a very long while, will be found to have yellowed slightly.

It has been claimed sometimes for some ancient objective that it gave a particularly fine orthrochromatic rendering, no doubt because one or more of its glasses served as a yellow screen. Of course, if orthrochromatic work is to be done, it is better to have a perfectly clear lens and to add to it a proper light filter adjusted to suit the plate and the subject, and not to rely on any accidental yellowing of the glass. In looking for this yellowing the lens should be held a few inches from a sheet of white paper, and the color of the paper as seen through the lens compared with its color as seen direct.

It will not be right, however, to jump to the conclusion that the lens has altered because the paper shows a slight tint, as a good many modern lenses are made with optical glass which is not perfectly white, and when the combinations are thick ones, as is sometimes the case especially in large lenses, they look distinctly yellow. Anything more than a slight tint, especially in a very old lens, which was pretty sure to be made originally of a white glass, may, however, be put down to a change. The only inconvenience a yellowed lens is likely to entail is a lengthened exposure, so that if rapidity is not important this may be ignored.

Some of the so-called Jena glasses were found after they had been made up into lenses not to be very permanent. The air affected the surface, which soon became dull and the lens useless. Of course, as soon as this was discovered the use of such glass was either abandoned altogether, or was limited to those glasses which were cemented with Canada balsam between other glasses and so protected; but a few such glasses undoubtedly got onto the market. By this time they have probably deteriorated to such an extent that it is very unlikely they would be usable and the defective surface or surfaces should be seen at a glance.

Cracked or Chipped Lenses

Next to the injury inflicted by vigorous cleaning, the most likely cause of detriment is a knock or a blow, caused generally by dropping the lens. It may be that this will cause the glasses to crack, or a piece to chip off. Contrary to what might be supposed, such an injury is not in itself any great harm, except so far as the selling power of the lens is concerned. One of the most useful lenses the writer possesses is a large old portrait lens, which certainly works as well now as when it was made, in spite of the fact that there is a piece the size of a sixpence chipped off one of the glasses, the rough surface

left being covered over with black varnish. A

crack might similarly do no harm.

But a crack or a chip, if not itself much detriment, is evidence that the lens has had a severe blow, just as a dent on the mount would be; and it should be treated in the same way—that is to say, not as an injury in itself, but as a warning to the purchaser to look very carefully for any signs of other ill effects from the

same blow.

Such ill effects would be a real "strain," not the kind of strain already referred to. Unfortunately, it is not easy to see such effects in the lens itself. The glasses might be thrown into a state of stress, or they might be shifted one on the other, or perhaps thrown out of center as a whole. None of these changes might be noticeable in an examination of the lens, though their effects would be visible enough as soon as one came to try it. For this and for other reasons, therefore, no lens should be bought second-hand without making a test of it.

Making a Simple Test

The ordinary trial of a lens by taking, say a landscape photograph with it, or exposing a plate on the first subject that happens to come in the way, is of no use at all for this purpose. The subject itself has near and distant objects in the center and at the edges of the picture, and, however good the lens, we cannot expect to get all these well defined at once with its full aperture. In fact, the better the lens the worse impression it might create on the mind of the photographer who has not had very much experience in examining lenses, since the fine definition which it would give in one part would make poor definition elsewhere all the more conspicuous.

A test subject must be arranged, and the best for the purpose that is likely to be at hand is a flat wall with a wall paper of fairly distinct pattern. The camera is set up opposite this, as far away as can be managed, provided the whole of the focussing screen is covered with an image of the wall paper; the camera is carefully leveled and arranged so that the front is parallel with the wall. Then, with the lens opened out to its full aperture, we can see at once, by focussing the wall paper as sharply as possible, the character of definition which it will give, and form some opinion generally on its performance. By focussing first the center and then the edges we can see whether it has a curved field, and, if so, to what extent, and at the same time can see the nature of the marginal definition.

A piece of card ruled with two sets of lines at right angles to each other may be attached to the wall so that its image comes at one corner of the screen. Then, by focusing first one set of lines and then those at right angles to them, we can form an idea as to the astigmatism

present.

Such a test may not seem so valuable as one made on one of the subjects for which the lens is to be used; but actually it is far and away more useful, and will tell the observer more of the way in which the lens will do its work than many trials on landscapes or buildings. The

chief difficulty that will be encountered will be to compare what the lens will do with what it should do.

Differences Between Lenses

The differences of lenses are differences of degree. Two lenses may both work at the same aperture, be of the same focus, and "cover" the same size of plate, but their behavior may be very different. One may cover the plate crisply to the extreme corners when tested on a flat subject; another may cover it just as well, but with a flat subject may need the corners to be focussed separately from the center; a third may cover after a fashion, but with some falling off.

In order to tell what is good and what is bad needs some experience; but if the photographer already has a lens he knows to be a good one he can compare the one tested with it and so form

some notion of its relative quality.

In all such tests there are two things to remember. One is that the test should be made with full aperture, except when a comparison is to be made with another lens, and then one test at least should be made with both at the same aperture. The other is that the relationship between focal length and the size of plate covered should be allowed for. A very poor twelve-inch lens at f/8 might cover a quarter-plate perfectly, whereas it would require a very high quality four and a half inch lens to cover the same size as well at the same aperture.

Repolishing and Repairs Generally

A word on another point may be added in conclusion. It is not wise to get a lens which needs any optical repair, unless it is exceedingly cheap and of a pattern still made and sold by its maker. Otherwise, the cost of replacing one of the glasses would be quite prohibitive. polishing the glasses is also not a thing to be regarded as practicable. Now that lenses are made in quantity, the expense of dealing with a single one is out of all proportion to the cost of a new lens. At the present time, with all the lens makers working at high pressure on optical munitions, no work at all of this kind is likely to be obtainable. Unless, therefore, the lens it is proposed to buy will do the work required without further modification than the purchaser can himself carry out, such as blackening the mount, it is best to have nothing to do with it.—T. D. PERCIVAL in Photography.

Toning Bromide or Gaslight Prints

ALTHOUGH the system of toning bromide or gaslight prints by means of bromo-ferricyanide bleaching, followed by treatment with sulphide of sodium, ammonium, or potassium, is in general use, and yields, as a rule, satisfactory results where matt surface paper or postcards are being toned, it is, however, generally conceded that the treatment in question rarely yields a pleasing result when used in connection with glossy paper, whereas the hypo-alum bath, while giving, as a rule, poor tones with matt paper, is found to give fine tones with glossy. Failures with

this bath when they occur are due, not to the fact that the bath is hypo-alum, but to some fault of omission, or commission, on the part of the worker, and the object of the present article is, so far as possible, to obviate the chances of such failures and make the process as plain to the tyro as to the more experienced worker.

In the first place, it seems to be considered by many printers that so long as the bath contains hyposulphite of soda and alum it doesn't much matter how much of either or what amount of hot water is added to form the bath; in point of fact, it is looked upon as a sort of mechanical process requiring no experience and very little painstaking, but in real practice it will be found that toning by means of this bath requires just as much consideration, and the bath itself, as well as the prints, need just as careful treatment as is required in any of the other processes connected with photography.

The Toning Formula

The best method of making a new bath is to dissolve 1½ pounds of hypo in 40 ounces of hot water and, when thoroughly dissolved, add 3 ounces of powdered potash alum and stir until thoroughly dissolved. Then bring the mixture to the boiling-point and, as the cookery books have it, allow to simmer for ten or fifteen minutes. A word is needed here as to the vessel in which the mixing and boiling is effected. It should be enamelled, and the enamel free from chips, for once the toning bath comes into contact with iron it may be counted as spoiled. It, therefore, behooves the toner constantly to examine his dishes where enamelled iron are used, and to guard them carefully from chance blows which might fracture the enamel and expose the iron to the action of the hypo-alum, or, what is really of more importance, the hypoalum to the action of the iron.

Ripening the Bath

It is better, when the initial cost is not a matter to be carefully considered, to use porcelain dishes for toning, and these should be, as it were, suspended in an enamelled iron dish containing hot water, which is kept at a uniform degree of heat by means of a small gas ring. The best means of arranging this suspension is to have the enamel dish containing the water just a shade smaller than the porcelain toning dish, so that the bottom of the latter shall be in contact with the hot water, but not with the bottom of the dish. When a new bath is made up it is usually found to have a tendency to bleach the prints, as well as to give a dirty yellowish tone. The process of simmering helps to obviate this, but, to make sure of having the bath correct, before putting in a batch of prints it will be found an advantage to add 20 grains of nitrate of silver in solution; this should be poured in slowly and stirred while pouring. Next add to the bath 2 ounces of ordinary white crystallized sugar and your hypo-alum is ready for use, or, rather, for trial, for, as no two makes of paper yield exactly the same results, it is necessary to test the action of the bath on the special batch of prints in hand. To do this allow your bath to

cool down to 120°, and then tone one or two prints therein. Should the tone be satisfactory, you can at once proceed with the batch, and a large number can be placed in the toning together.

A Danger from Overcrowding

By "together" I do not mean putting prints in in a solid lump, or disaster will at once occur; the water in the inside of the lump of prints will not come in contact with the hypo-alum, but it will with the heat, and before you can separate the prints the hot water will melt them and the poor bath will probably get the blame. Each print, or sheet of prints, must be put separately into the bath and brought into contact with it in every part before the next sheet is put in. The necessity for this lies in the fact that while the bath itself will harden the gelatin rather than melt it, yet the steam will have the reverse effect if it is allowed to act upon the print before thorough immersion. Should the test prints not yield a satisfactory tone and be of too warm a shade, increase the heat of the bath to 160° or 180° and try again. If this does not have the desired effect, reduce the strength of the bath by the addition of a fourth its volume of hot water. (Do not add the hot water while the prints are in the bath.) Should the prints, on the other hand, be of too blue a tone, the remedy will be found in lessening the degree of heat or in strengthening the bath by the addition of more hypo and alum. It will also be tound that, as a rule, prints developed with amidol yield a warmer tone than those developed with metol-hydroquinone, though either give good colors with most brands of paper.

Some Misapprehensions

Occasionally a sample of paper may come your way which is not at all amenable to either a hot bath or a cool one, a weak one or a strong. This is usually caused by an excessive hardening of the film either in the manufacture or after development; the use of formalin for hardening previous to toning will be found usually to give dull bluish tones, and not at all equal to those obtained where alum has been used. There seems to be much misapprehension as to the cause or causes of melting in the bath, and many a young toner, on the first signs ot such, adds alum, with the idea of preventing it, but in nine cases out of ten he simply adds to the trouble.

This can be easily tested by putting a print in a hot solution of alum alone, when it will be found to melt at once, thus showing the necessity for keeping up the proper proportions of both hypo and alum. If a bath becomes too weak, melting of the emulsions is a necessary sequence. Thus it will be seen that every now and again—say, every three hours—a small quantity of new bath should be added to that in use to make up for that which has been taken up by the prints that have been toned. Should the bath at any time turn of a gray color and give off an acrid smell, it should be at once discarded before it causes trouble, as it is quite used up. In cold weather the bath, when left overnight, will be

found in the morning covered with crystals; these should not be skimmed off and thrown away, as they are not, as might be imagined, ice, but almost pure hypo, and when the bath is once again warmed they melt again and the bath is as good as ever.

To Protect the Hands

One of the main objections to hypo-alum toning has always been its effects on the hands of the toner, and it has often been alleged that there is no means of preventing this, as indiarubber gloves are not usable in a hot solution; but there is no reason why an old pair of dogskin or deer-skin gloves should not be worn, and some toners thoroughly rub their hands with oil or vaseline before commencing work for the day. It will be found that, contrary to expectations, the oil does not come off on to the prints, and it has no effect on the bath.

It may be queried why sugar is herein given as an ingredient of the bath. In point of fact it is not a necessity, but at the same time it has its advantages especially where a strongly hardened emulsion is being used, as it causes the prints to come away from the glazing glasses in a flatter condition and prevents cracking of the emulsion; its effect is practically the same as the glycerin bath often used with matt print.

Cold Hypo-alum Toning

Should the reader still be opposed to the hot hypo-alum bath and still desire to obtain the same tones, it is in his power to obtain them without the heat, provided he is in no violent hurry to turn out his work. The average time for toning in the hot bath is fifteen to twenty minutes, but if time is not a special object he

should proceed as follows:

Dissolve 3 pounds of hypo in 60 ounces of water and add 6 ounces of powdered alum and bring it to the boil and allow to boil gently for some ten or fifteen minutes, then pour into a deep dish or wooden tank and allow to cool. Prints placed in this bath at a temperature of 60° will be found to tone evenly, and a good color in twelve to fourteen hours, i. e., if placed in the bath overnight and moved about for some few minutes, so that they become evenly and thoroughly saturated, they will not stain by being left until the morning, when they will be found toned and ready for washing. A word as to the washing: There is a certain amount of deposit in the hypo-alum bath, be it either hot or cold, and it is therefore advisable that all prints taken from it should be lightly sponged over after one or two washing changes of water. After the sponging, very little more washing will be necessary. Should the cold bath become colder than 60°, toning will be very slow indeed; but as the bath gives off no offensive fumes, there is no reason why it should not be placed in a warm room, where the temperature will not fall too much during the night. Of course, this is merely a cold weather hint, and mainly applies where the toning room in ordinary is in an outhouse.—British Journal of Photography.

An Economical Pyro-soda Developer

This proves an excellent developer for both plates and films, and keeps indefinitely if well corked up. The under-mentioned will be found sufficient for a year, if as many as half a dozen plates were developed a week:

A			
Pyrogallic acid		1	oz.
Bromide of ammonium		$\frac{1}{2}$	OZ.
Metabisulphite of potash		$\frac{1}{2}$	OZ.
Water		16	OZ,

Dissolve the last two in water, and then add the pyrogallic acid.

B
Carbonate of soda (washing soda) 2 parts
Sulphite of soda 1 part

The carbonate of soda should be in crystals, and enough to cover the bottom of a fairly large bottle, and then filled to the brim. For use, take 1 dram of A to 2 ounces of water, and then add 2 drams of B; this, when mixed, will only keep for several minutes, fresh solution being required for each plate. If the image does not appear in thirty seconds, keep adding more of B; if, on the other hand, it appears too quickly, dilute with water, and add more of A. At the first appearance of the image the plate should be transferred to a bath containing water (the plate being saturated in developer will continue to develop until the image can be clearly seen), and then transferred back to the developer until the required density is obtained. This developer stains the fingers, but produces negatives yielding good-quality prints.—Amateur Photography.

Igniting Flash Powder

One of the best methods of igniting flash powder is to place the heap of powder on a tray, and instead of using the touch paper supplied to insert a strip of an old roll-film negative. We have all of us in the course of flashlight work experienced the touch paper going out immediately it reaches the powder, due to some unexplained cause, but if the plan noted above is adopted this will not occur. Again, it is quicker and less of an ordeal for the sitter, who is often on tenterhooks while the powder is being ignited in the ordinary way and the paper slowly turns its way down to the powder. Every portrait worker knows that such is not productive of the best facial expression.—Amateur Photographer.

Silhouette Photographs

These interesting novelties are not difficult to make if due care is exercised in posing the sitter. The writer used to work in a ground-floor room at the back of the house, having a fairly low window, before which a chair was placed for the sitter. A white sheet was stretched across the window, and illuminated from behind by means of magnesium ribbon, the operation being conducted at night owing to the variation in intensity of daylight, accord-

ing to climatic conditions. The magnesium should be slowly moved about a short distance behind the screen by an assistant. The best results were obtained by giving a short exposure, using a small stop and a fairly rapid backed plate. Development should be conducted with a view to getting a harsh black and white contrast, and prints made upon gaslight paper. A perfectly true profile is not required in a silhouette, but the head should be slightly turned to secure the eyelashes. Of course it would never do to burn magnesium ribbon in the back garden at night nowadays, or all the police in the neighborhood would be round to see who was signalling to Zeppelins. Accordingly, the writer has since modified the above process slightly, using a room divided from another by means of folding doors, across which the sheet is fixed. The room in which the camera and sitter are placed should be darkened so that all the light comes from behind the sheet.—Amateur Photographer.

War Chemicals

APART from considerations of economy, quite a lot of interest attaches to the study of chemicals as we get them today. The limitations, and the difficulties of carrying on work, are of course not so apparent to the amateur as to those who carry on photographic work on a large commercial scale, or who are engaged in the manufacture of photographic materials.

The photo-engraver, for example, who wants rubber solution for his work, has nowadays to seek the help (and permission) of the Ministry of Munitions, for rubber is dissolved in benzole, and benzole is the starting-point of a number of high

explosives.

Probably the most anxious moments of the amateur were those in the early days of the war, when metol and other developing agents ran short, and discussions were rife on the uses of ferrous oxalate, that old-fashioned, messy, but nevertheless excellent developer of pioneer days in photography. When the British manufacturers came to compete, or to produce, developing agents, they were faced with the difficulty that most of them were, in Germany, by-products, or derived from by-products, which cost the big aniline dye manufacturers very little. The price thus rose inevitably, but the fact remains that we have manufactured in this country two or three excellent substitutes for the Germanmade metol, which are daily gaining in popularity.

Solutions of these chemicals sometimes discolor through oxidation rather quickly, causing waste. This can be overcome by using a large proportion of preservative, and by making up one's developer always with distilled water or water freshly boiled (to expel the air), and also

by not making up too large a quantity. There was an old-time dodge of filling a bottle, as the developer was used, with glass beads, so that the bottle would always be filled to the neck and there would be no space for air. A simpler and probably cheaper way is to use small bottles for bottling. Thus if you want to make up 80 ounces of monomet developer, it is far more satisfactory to bottle it into eight 10-ounce

or four pint bottles than to have it in one

winchester-quart bottle.

A point worthy of consideration during the war, when potassium salts, largely derived from Stassfürt, are high in price, is the substitution of sodium salts in all cases where possible. Those who use bichromic salts, for example, for carbon printing, gum work, or any type of process work, will find that sodium bichromate is very much cheaper than potassium bichromate, and in all cases less amounts are required. Take the case of sodium and potassium bichromate as an example.

Sodium bichromate, Na₂Cr₂O₇; molecular weight, 262 Potassium bichromate, K₂Cr₂O₇; molecular weight, 294

The sodium salt is lighter, and 1 part goes as far as 1.12 parts of the potassium salt. These weights are arrived at by adding together the atomic weights of each element composing the substance; thus caustic soda, NaOH, is sodium (23), oxygen (16), and hydrogen (1) = 40, while caustic potash, KOH, is potassium (39), oxygen (16), and hydrogen (1) = 56; 40 parts of sodium hydroxide or caustic soda are equivalent to 56

parts of potassium hydroxide.

There are many other cases where a cheap salt may be used as a substitute for a more expensive one. Thus washing-soda crystals may be used in the preparation of developers instead of sodium carbonate, of which they are merely a less pure variety; washing soda sometimes contains a very small amount of caustic soda, which acts much more vigorously as an accelerator, especially with metol and paramidophenol substitutes for metol. A small trial lot of the developer should be made up first, to see how it behaves with washing soda, as it may be found that the quantity must be reduced.

Apart from substituting cheap products for more expensive ones in a given formula, there is the wide question of the choice of a formula. One notable instance that comes to mind at once is the gold toning bath extensively used in the States, the cost of which, on a large scale, is considerably below that of the sulphocyanide bath so popular with us. The American procedure referred to is to prepare a weak solution of gold chloride, about 1 grain to 20 ounces of water, and to add a few drops of sodium bicarbonate solution until the bath is just alkaline—as indicated by its just turning red litmus paper bluish. This bath is economical, and at any rate does away with the sulphocyanide.

Then again there is the question of fixing—

Then again there is the question of fixing—the amount of hypo necessary to fix a given number of plates. "Hypo is so cheap," the reader may say, "that it is not worthy of consideration." It may not be on the small scale, but we know of instances where hundredweights are needlessly wasted during the year, and instances where making the hypo run out too long has led to serious results through the after-deterioration of negatives. Roughly speaking, 248 parts of hypo are required to "fix" 188 parts of silver bromide. If we assume that there are about 10 grains of silver bromide in the film of

whole-plate, something over 13 grains of hypo would be needed to react with it; in other words, a pound of hypo would fix about 537 whole plates. The hypo, however, must be present in excess.— Amateur Photographer.

Method of Preparing Printing Surface with Mercurous Salts

A method of making collotype plates giving much longer runs without redamping, and also a film that is tougher than that of plain gelatin, and which is very much more sensitive to light under the negative, is worked by mixing mercurous oxalate with the gelatin.

The mercurous oxalate is made as follows:

No. 1

Mercurous nitrate 1 oz. 25 gr. Water . . . 10 oz. 250 c.c.

No. 2

Oxalic acid . . 120 gr. Water . . . 10 oz. 6 gms. 250 c.c.

These two solutions are warmed to a temperature of 176° F. (80° C.), then No. 2 is poured slowly into No. 1, stirring gently with a glass rod, then allow the precipitate to settle; pour away the liquid as closely as possible without disturbing the precipitate, fill up with clean water, use stirring rod vigorously; again allow precipitate to settle, then again pour away the liquid without disturbing the precipitate; repeat this operation seven or eight times, then pour precipitate upon filter paper and allow to drain. Then mix with:

Soak gelatin in the water till it is soft, then proceed to dissolve by placing vessel containing soaked gelatin in a pan of water, then add the sodium chloride, and stir well; then add the precipitate of mercurous oxalate, mixing thoroughly, and allow to stand a day or so. Then oughly, and allow to stand a day or so. squeeze through coarse netting so as to break up into very small particles, placing the threads or particles in a muslin net, and suspend in a jar of water and wash in six or eight changes of water, taking care that the water gets free access to all parts of the gelatin.

This may now be stored in a wide-mouthed

bottle or jar until required.

To make up the mixture for the collotype film, take:

Middle hard gelatin . 1 oz. 30 gr. Water 9 oz. 250 c.c.

Soak gelatin until it is quite soft, then proceed to melt as usual, and when gelatin is dissolved add 1 ounce of the mercury-gelatin mixture (30 grams), stir vigorously so as to mix all together, then proceed to coat the plates as usual, allowing 5 minims per square inch.

These plates are sensitized in:

Potassium bichromate 2 oz. 30 gr. Water . . . 16 oz. 500 c.c.

Liquor ammonia must not be added.

The time of sensitizing and mode and time of drying is also as usual, with the exception that the exposure to light under the negative is about one-fourth of that needed by plates prepared without mercurous oxalate. The progress of the light action can be seen from the back, and must be the guide for the first few plates. Afterward the operator will have made his own guide.

These plates are washed, dried, and prepared for the press in the same way as ordinary collotype plates, but great care must be taken that neither ammonia nor hyposulphite of soda or any other alkali comes in contact with the film, else the film will be blackened and to a certain

extent spoilt.

This method gives very fine, soft results, and the films yield more impressions than the ordinary collotype film does.—W. T. WILKINSON in The Process Monthly.

Flashlight Hints

WITH the coming of winter professional photographers naturally expect to be asked to do work in the evenings which can be carried out only by flashlight. There is very little difficulty in lighting small groups or single figures, but in taking large dinner parties, dances or dramatic performances, where a wide space has to be illuminated the inexperienced operator rarely produces a satisfactory negative. Nine times out of ten the trouble is caused by using too little light.

It may be taken as a general rule, that, when the powder is burned in a properly designed lamp or tray, the amount of light produced is in direct proportion to the amount of powder used. This fact must be remembered in conjunction with the other well-known fact: that the intensity of the light decreases in the ratio of the square of the distance between the source of light and the object. To make practical use of this knowledge, it is necessary to find out the quantity of powder needed to give a correct exposure, say, with the light 10 feet from the sitter. It is then only necessary to multiply this quantity by the square of any greater distance at which it may be necessary to work. For instance, if 30 grains of flash powder give a well-exposed negative at 10 feet from the sitter, it will take twenty-five times as much for a

similar subject at a distance of 50 feet. The reflecting power of the walls and other surroundings has to be taken into consideration. If the experiment is made in a small room with light walls, the exposure will, of course, be helped by reflected light. In large halls, however, the principal subjects are generally so far away from the walls that little or no reflected light can reach them. Due allowance should be made for this in making the calculations.

The main things to remember are to use the most actinic powder obtainable, and plenty of it; to place the lamp as near as possible to the subject, consistent, of course, with even lighting; and to take care that the flash is well screened from the lens.—Professional Photographer.

Making a Focussing Screen

When a focussing screen gets broken, it is not always easy to find a piece of glass which has a fine enough grain to replace it. The simplest way out of the difficulty is to grind the glass yourself. This can easily be done by taking two spoiled negatives of the right size, cleaning off the films and grinding the surfaces with fine emery powder, the kind sold as knifepowder being the most suitable. One of the pieces of glass is fastened to a flat board with tacks or brads; the heads of the fasteners must, of course, be kept below the surface of the glass. A little powder is dusted over the glass and sprinkled with water, and the other piece of glass placed on top of it. The two surfaces are then ground together with a constantly varying motion. By spreading out the fingers the pressure can be equalized over the whole surface. As both surfaces are in contact with the powder, two glasses are ground at the same time. A couple of half-plates can be finished in this way in less than a quarter of an hour.—Professional Photographer.

A PROMINENT pictorial photographer remarked the other day that a print was a failure if it wouldn't stand a white mount. There's a lot of truth in it. When a picture has all its tones in harmony, it will always look right on a white mount.—Professional Photographer.

Pinholes in Photographic Plates

PHOTOGRAPHERS give the name of "pinholes" to the small transparent spots seen upon plates, and in the printing these produce corresponding black spots on the paper. The sizes and shapes of these spots vary according to the causes which produce them, and it is instructive to examine them under a glass in order to note the cause and thus employ the best means for avoiding them. Very small and irregular spots are due to dust which settles on the plate, while circular or elliptical spots are caused by air bubbles in the emulsion or the developer. It is very difficult to avoid the settling of dust upon plates, and especially when traveling, for the dust being suspended in the air, is always ready to fall on the plate even when it is well dusted.

It has been proposed to apply glycerin to the edges of the shutter and to the sliding parts of the plate holder, but this does not appear to be a very practical idea. On the other hand, dust is often produced inside the plate holder itself by the friction of the rough edges of the plate upon the wood frame. The best way to overcome this drawback when the plates have already remained for a long time in the holders is to place the latter in the position which is to be occupied during the exposure and then strike a sharp blow, so as to make most of the dust fall to the bottom, at least the largest grains. Plates which have an anti-halo covering on the back are subject to pinholes because the pigment scales off when rubbed by the spring, for this latter bears upon the opaque layer. A good method is to apply a piece of black paper on the back of the plate to keep the spring out of contact with the pigment. Small round spots are oftenest caused

by air bubbles in the developer, and these in turn come from the use of a water supply from a faucet to dilute the concentrated bath. This can be avoided by using boiled water, or at least by allowing the water to stand for a few minutes so that the bubbles can rise to the surface and

disappear.

In warm and damp climates it is noticed that plates and especially celluloid film are quite subject to pinholes, and it is a good plan to use a containing box which is kept dry by chloride of calcium. Pinholes can be stopped up by the use of black water color applied in an almost dry state with a very fine brush. Carmine can also be used, but in the semi-transparent parts of the plate it is not recommended to use the various opaque colors, which would replace a transparent point by an opaque point and would not match the tone of the plate, thus giving a white point upon the print instead of a black one. In such places, care should be taken to match the tone, after a few trials in printing. It is a good plan to put colors on with a pen instead of a brush, because the former lays on less color. As to very small spots, these can be neglected, for in the negative the irradiation makes them seem larger than they really are, and they are almost invisible on the prints viewed without a glass.-Scientific American.

A New Method of Intensifying Negatives

MERCURIAL intensification has always been regarded as a somewhat risky undertaking, to be embarked on with diffidence and even reluctance in the case of negatives of especial value. Apart from the by no means remote possibility of a resulting plentiful crop of pinholes, or of reticulation of the film, intensification with mercury possesses the disadvantage of being a twostage process—first bleaching, then blackening, so that it is impossible to regulate with accuracy the final degree of density. The chromium method has the same drawback, and is also

liable to produce a clogged-up effect.

We shall therefore find it advantageous to discard these modes, adopting one in which the increase of density commences almost immediately on immersion, the operation being brought to a conclusion at any desired stage by the removal of the negative, which then only requires a brief washing. A by no means negligible advantage of this single-stage plan is that the negative may from time to time be removed, and, after a slight rinse, placed wet in the carrier of the enlarging lantern, and the strength of the image visually judged on the easel, or a trial print made. Should it be found that a still greater increase of density is required, it only remains to replace in the intensifying solution. Apart from the convenience of thus being able to control the strength of the negative the results will be found much more satisfactory than when mercury or chromium is employed. method strengthens the negative not only by building up the deposit, but also by a gradual alteration in its color through a range of warm blacks which pass into a series of browns, the negative thus becoming of increasing actinic opacity.

The intensifier is prepared by dissolving

Copper s	sulp	hat	е			20 gr.
Pot. ferr	icya	anid	e			10 gr.
Water						5 oz.

A precipitate is formed, which disappears on the addition of

250 gr. Ammonium carbonate . .

The solution will keep indefinitely in a wellcorked bottle.

The negative, previously soaked for a few minutes in water, is placed in a tray, and covered with the solution, and examined at frequent intervals. When the required density has been reached ten minutes' washing in running water

is given.
I am of opinion that this mode of intensification will be found useful, not only in the case of negatives which through faults of exposure or development require their density increased, but I am inclined to think that negatives of better quality are secured by stopping development before full printing strength has been reached, fixing, washing, and then intensifying in the manner described. No inconsiderable advantage lies in the convenience of deciding the exact degree of density in open artificial or daylight instead of in the dark-room while the plate is still in an unfixed condition.

The acid amidol developer, which does not

readily give harsh results, and produces a deposit of beautiful transparency, is eminently suitable for use in this connection.—DAVID IRELAND in

Amateur Photographer.

Self-portraiture by Flashlight

Now that the long evenings have commenced again, the amateur who is hard up for suitable models might do worse than try his hand at self-portraiture by flashlight—either ordinary portraits or character studies. The latter have the advantage of combining two hobbies

If the results are unsatisfactory (and there is no reason why they should be if care is taken)

the experience gained will be valuable.

The method I use is as follows—of course, with slight variations according to the subject and effect required. Obviously this will also apply

to portraits of other people as well.

In the diagram, C is the camera, S the sitter in an open doorway, D a diffuser of muslin or a dusting sheet, F the flashpowder, R a reflector, and B a dark background (e. g., dark curtains) hung a few feet behind the sitter so as to be out of focus

During the whole operation a weak light can be left burning in the room, so long as it does

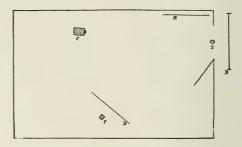
not shine direct on to the lens.

The exact position and pose of the sitter are determined beforehand, and a candle is placed in that position and sharply focussed at large

aperture.

The flashpowder is now prepared and placed in position behind the diffuser, not too close or it may set it alight. The amount of powder must be determined by experiment and depends upon circumstances—if I gave quantities it might be

misleading. A piece of touch-paper made by soaking blotting-paper in a strongish solution of potassium nitrate (niter) and drying, and then cutting into strips about a quarter-inch wide and ten inches long (this will burn in about eight seconds) is placed with one end in the heap of flashpowder.



The pose and costume, etc., being determined, the shutter of the camera is opened, the end of the touch-paper ignited, and the position taken up as quickly as possible—five seconds is ample time for this. After the flash the darkslide is closed and the lens capped. At this point it is advisable to open the windows to let out the smoke, bearing "Dora" in mind as regards lights.

The plate may now be developed while the smoke clears off. Development should be on the soft side with a diluted developer. If the exposure has been correct and a dark background used, the image usually appears rather quickly, but do not under-develop on this account; be still more careful not to over-develop, or the high lights will print as white paper. exposure also must be guarded against.

Flashlight also offers a large field for experimental work.—J. F. L. Wood in *Amateur*

Photographer.

Blocking-out Films

To block a film successfully, the following hints, if carried out with care, will be found indispensable. Amateur dealers and the average middle-class photographer are often called upon to enlarge a print from one part of a film, say a single figure or head from a group, and at the same time keep the film intact and unspoiled for future general use. We have found that the war-time opaques can by no means be trusted not to eat into the film or damage it in some way if kept on temporarily and sponged off again. So we have hit upon the following: First take a piece of glass and place in the retouching desk in the usual way to form a firm transparent foundation. Take the film and a piece of clean glass the same size, and bind together temporarily, with the film side inside (or against the Place this in the retouching desk, with the glass toward you, and carefully block round the figure or portion required, just as if you were doing a negative on the glass side. When finished and dry, reverse the position of the film and the glass you have blocked by lifting the film from the back and putting it in the front of the glass. Thus you have the negative side of the film toward you and the glass at the back of it, with the blocking in the middle or in close contact with the back of the film. See that your work fits the outline correctly, and bind securely together for printing. That this blocking can be quickly removed at will with perfect safety can easily be seen.—*British Journal of Photography*.

Real Causes of Blisters

BLISTERS on prints are seldom due to any fault in manufacture of papers, but they may be produced on any gelatin paper by improper manipulation. The best way to prevent blisters is to understand their causes—the remedies

then become obvious.

Blisters may form on prints during developing, fixing, washing or toning, or partly during either operation. Their formation during development is a rare occurrence. The same is true of fixing, unless the print is transferred direct from a strongly alkaline developer to a strongly acid short stop bath or fixing solution, in which case small bubbles of gas are formed within the gelatin film because of the action of the acid on the alkaline carbonate. The formation of gas in the gelatin is over the entire surface of the print. If for any reason the gelatin film has become softened, a small glass balloon is formed under each weak spot where gas is being liberated, resulting in blisters or so-called air-bells. If the developer is not too alkaline or the acid short stop or fixing bath is not too acid, and prints are rinsed after developing, such blisters are not formed.

Air-bells or blisters are liable to occur if the water used for washing contains an excess of dissolved air. Water under high pressure is usually the cause of the trouble. The water contains a great amount of dissolved air and the gelatin emulsion is saturated with water. If the temperature of the water is slightly raised, this air is expelled with the result that it may raise the gelatin and form an air-bell. If the gelatin has been properly hardened the air-bells are not so likely to form. If this trouble is a persistent one, the remedy would be an open tank into which the water could be drawn from the tap. This relieves the pressure and allows the air to escape. Heating the water will expel

the air more quickly.

All blisters, however, are not gas or air blisters. They are often filled with liquid, in which case they are caused by the phenomenon of osmosis. If a solution of some one of the forms of salt, hypo for example, is inclosed within the gelatin film of a print, the gelatin can only be penetrated by water or a solution of lower concentration than the hypo. If a print saturated with hypo is placed in water, it is natural for the hypo, of high concentration, to be forced out of the gelatin by the water. This force which causes the water to penetrate the gelatin and expel the hypo until the two solutions are of equal concentration is called osmotic pressure.

If by swelling, softening, or for any other reason, the gelatin becomes less porous in one spot than another, the water will penetrate the gelatin faster than the hypo is expelled, with the result that a blister will form. This osmotic pressure is often great enough to break the gelatin emulsion. If the gelatin has been properly hardened and the print carefully handled, the gelatin should be uniformly porous and no such trouble experienced.

Most blisters are formed during washing after fixing, and their production is assisted by the presence of cracks, creases or folds in the paper, since wherever these occur the gelatin film is likely to be broken away from the paper

support.

Likewise, any factor in manipulation which tends to soften the gelatin locally tends to produce blisters. A powerful spray of water will soften the gelatin in the spot where it strikes the print, and touching the print with warm fingers will soften the print at the point of contact.

Washing at high temperatures should be avoided as much as possible, and in all cases the temperature of the various solutions should be maintained as nearly the same as possible. A frequent cause of blisters is the transference of prints from a warm fixing bath to cold water, and *vice versa*. In cold weather keep a fixing bath where it will be as cold as the water used for washing.

Apart from the effect of temperature, the use of alkaline wash water or an alkaline fixing bath, caused by carrying developer into the fixing bath with the prints, will tend to soften the gelatin and produce a condition favorable to blisters. It is important then to maintain the acidity of the fixing bath, or use a fresh bath at

all times.

Blisters formed during after-treatment are usually caused by toning, and may be due to insufficient hardening, the use of one of the acid bleaching baths, an excessively strong sulphiding bath or too hot a hypo-alum bath, together with one or all of the above causes. If a print is not thoroughly hardened and is placed in a very hot hypo-alum toning bath, it will soften before the alum can begin its harden-

If, during final washing, it is seen that blisters have formed, the paper underneath may be pricked and the water squeezed out, or the print may be immersed in equal parts of water and alcohol, followed by a bath of alcohol alone. It is better, however, to prevent toning blisters by drying prints before toning, or better still, by treating with a 3 per cent. solution of formalin after washing and before toning, with or without drying, if there is any reason to believe prints may not be sufficiently hardened to withstand toning.—Studio Light.

A Simplified Method of Writing Developing Formulæ. By C. E. K. Mees (Abstract)

The usual methods of writing developing formulae make it very difficult to compare different formulæ, so that it is not unusual to find several formulæ which are apparently quite different, but which, if written in the same form, prove to be identical in composition.

¹ Communication No. 52 from the Research Laboratory of the Eastman Kodak Company. In order to facilitate the comparison of formulæ it is convenient to be able to write a formula in one line, thus enabling a number of formulæ to be written under one another and compared at a glance; the following notation enables this to be done.

The formulæ are expressed in grams per liter, the water being omitted. Then if R stands for the reducing agent, A the alkali, S the sulphite, and B the bromide, the formula is always written in the order R A S B, which is used as mnemonic. Thus 5–50–50–1 means 5 grams of reducing agent, 50 of alkali, 50 of sulphite,

and 1 of bromide per liter.

In order to indicate the particular substances used, the reducing agents are represented by initial letters—P for pyro, H for hydrochinon, and so forth; while, if no other specification is given, A represents sodium carbonate dry, S sodium sulphite dry, and B potassium bromide; thus P5–15–10–0 represents the following developer:

Pyro	5 gm.
Sodium carbonate (anhydrous)	15 gm.
Sodium sulphite (anhydrous)	10 gm.
Water to	1000 c.c.

Other chemicals are represented by their formulæ or by any other convenient abbreviation, so that the well-known hydrochinon-caustic potash formula used for process plates may be written H12.5-KOH25-Meta25-12.5, this corresponding to:

A		
Hydrochinon		12.5 gm.
Potașsium metobisulphite		25.0 gm.
Potassium bromide		12.5 gm.
Water	,	500.0 c.c.
В		
Caustic potash		25.0 gm.
Water		500.0 c.c.
Use equal parts A and B.		

A convenient means of classifying developers containing a mixture of metol and hydrochinon as the reducing agent has been in use for some

time in our Research Laboratory.

As a result of a series of measurements it was found that the formula 5–25–55–1.5 was most convenient and suitable for these developers, and this formula was entitled MQX, the suffix X representing the percentage of the reducing agent, which is metol; thus MQ_{20} corresponds to 20 per cent. metol, 80 per cent. hydrochinon, or a developer of the formula:

Metol			1.0 gm.
Hydrochinon			4.0 gm.
Sodium carbonate			25.0 gm.
Sodium sulphite .			75.0 gm.
Potassium bromide			1.5 gm.
Water to		1	000.0 c.c.

 MQ_0 represents the same formula without metol and with 5 grams of hydrochinon, MQ_{50} corresponds to $2\frac{1}{2}$ grams metol and $2\frac{1}{2}$ grams hydrochinon, and MQ_{100} to 5 grams metol without hydrochinon.

The most useful members of this series have proved to be MQ_0 , MQ_5 , MQ_{25} , MQ_{50} , and MQ_{80} .

Fog and How to Deal with It

When a professional gets a fogged negative he can generally recognize the nature of the fog and put his finger on the cause. The young assistant, however, is apt to assume that all fog is caused by the action of light on the plate before or during development. He learns later with surprise, that there are other kinds of fog which may occur even when the plate is handled in a perfectly safe light. He finds that, besides ordinary light fog, there are atmospheric fog, chemical fog, and the peculiar form of chemical

fog known as dichroic fog. Atmospheric fog, as its name implies, is actually present in the atmosphere, but it is often visible to the photographic plate when it is invisible to the eye. This happens whenever the moisture or dust in the air reflects ultra-violet and violet rays, instead of the visible rays belonging to other parts of the spectrum. And so it happens that a landscape, which the photographer thinks is free from all fog, may really be bathed in a thick invisible ultra-violet mist which is faithfully recorded on the plate. This experience is familiar to all who have done much photography in the West among the snowcapped mountains. Distant mountains can often be plainly seen when it is impossible to photograph them on an ordinary plate without a light filter. The whole difficulty is very simply solved by the use of Panchromatic plates and a K2 or K3 filter.

Chemical fog is of an entirely different nature. It is due to uncontrolled chemical action during development. The whole process of development is based upon the principle that the developer will reduce to metallic silver those particles of silver salt upon which the light has fallen, whereas the particles upon which the light has not fallen will remain unaffected by the developer. If a very strong developer is used, however, there is a danger that it will reduce the particles of silver salt, whether the light has fallen on them or not, and the metallic silver which is thus deposited evenly all over the

plate is known as chemical fog.

It is sometimes said that chemical fog is due as much to the instability of the silver salts in the emulsion as it is to the strength of the developer. The emulsion of a modern dry plate, however, is seldom at fault—but the developer which suits one emulsion is not always suited to another. The wise professional sticks to the formula recommended by the makers of the plates which he uses. Even when he does so, he may get chemical fog if the developer is too warm, or if he forces development in any other way. Some plates will stand more heat than others without fogging; but it is a safe rule never to use a developer below 65° or above 70° F.

The established method of guarding against chemical fog is to add potassium bromide to the developing solution. It has been suggested that the bromide combines with the silver salts

in the emulsion to form a double compound of silver, which does not respond so readily to the action of the developer, and that there is, accordingly, less risk of the developer reducing any particles of the silver salts upon which no light has fallen. This is only one theory out of many. Few subjects in photographic chemistry have aroused such fierce controversy as the part played by bromide in the developer.

The fact remains that potassium bromide, in small quantities, is an efficient protection against chemical fog, and, in larger quantities, is an efficient means of adding to the contrast and

brilliancy of the negative.

The most curious fog of all is a peculiar form of chemical fog known popularly as green fog and scientifically as dichroic fog. It is found on negatives in the form of a stain, which is yellowish-green by reflected light and reddish pink by transmitted light. This characteristic explains its scientific name—for dichroic fog means literally "the two-colored fog."

Its nature and its cause are not so easily explained. The general view is that dichroic fog is found only when some ingredient of the developer has the power of dissolving the silver salts in the emulsion. Silver bromide, silver chloride and silver iodide are all practically insoluble in water—but they are all easily soluble in ammonia or ordinary hypo, and are slightly soluble in sodium sulphite. And so this peculiar trouble was very common in the old days when nearly all plates were developed with pyro-ammonia, and it is still apt to occur when the developing solution contains hypo or an excess of sodium sulphite.

When the developer contains none of these solvents, the silver salts remain firmly embedded in the gelatin emulsion, but when any of these solvents are present, some particles of silver salt are dissolved out of the emulsion. If the salts react with the developing reagent while they are in this state of solution or semi-solution, the metallic silver is deposited on the surface of the plate in an extremely fine colloidal state. This deposit is what is known as dichroic fog. It is naturally heaviest in the shadows where there has been the least light action, because it is in these parts that the particles of unreduced silver salt are the most numerous.

The chief characteristic of dichroic fog is that it is almost entirely on the surface, while chemical fog is a deposit in the body of the gelatin emulsion. Dichroic fog may often be removed by simple friction, or by mechanical reduction, as it is called. Generally speaking, it is difficult to get rid of it except by some form of surface

reduction.

Troublesome as these three varieties of fog undoubtedly are, ordinary light fog causes still more trouble because it is so common. It is sometimes due to plate holders and dark-rooms which are not light tight, but it is still more often due to the use of unsafe dark-room lamps.

Fortunately photographers are now recognizing more and more that they cannot rely on ordinary red, yellow or orange glass or paper to intercept the actinic rays. Many of the darkroom lamps which used to be sold gave barely enough light to make a few objects visible, and

yet they transmitted such a large proportion of violet and blue rays that any plate of moderate speed was almost certain to be fogged. Nowadays these old lamps are being rapidly replaced by Wratten Safelight Lamps. The Wratten Safelights are made of glasses coated with gelatin of that precise color which will give the maximum of illumination and yet transmit only those rays of light to which plates are least sensitive; and the Wratten Lamps are so constructed that only reflected light is used. These two improvements being based upon scientific principles have practically eliminated light fog from professional dark-rooms.—Studio Light.

Physical Reduction for Negatives

Ground cuttlefish and resin mixed in equal parts make a very good powder for rubbing down an overdense part of a negative. best way to use it is to take some of the powder on the finger tip and rub with a circular motion on the part to be reduced. If the part is too small for this method, use the powder on the point of a paper stump. For large spaces, where more friction can be used, fine pumice and the finest grade of emery mixed together make a very good powder. The emery should be the grade used by opticians and jewellers.—The Professional Photographer.

Formula for Collodion and Iodizer for Making Transparencies or Diapositives

Plain Collodion

Sulphuris ether, sp. gr. 0.720 10 fl. oz. Pure alcohol, sp. gr. 0.805. 5 fl. oz. 90 gr. Soluble cotton (pyroxiline)

Iodizing Solution

Pure alcohol, sp. gr. 0.795	5 fl. oz
Cadmium iodide	20 gr.
Ammonium iodide	20 gr.
Cadmium bromide	10 gr.
Ammonium bromide .	12 gr.

As soon as the above are dissolved they may be mixed in equal parts and should be kept in a

mixed state for a while before using.

The glass plates are coated and sensitized in a nitrate of silver bath in the usual way, and may be developed by means of acid iron developer, or by pyroxilin and citric acid developer; then fixed and washed in the usual way.

The ordinary collodion used by photoengravers is generally too strongly iodized and leaves a coarse deposit in the development by the usual iron acid developer; this causes the enlargement to be coarse in the film structure.

Suiting the Paper to the Negative

EVERY photographer of any experience at all knows that by a choice of printing methods he can get bright prints, full of contrast, or soft, delicate ones at will, from the same negative, and this power is a very valuable one in view of the difficulty of determining precisely how far to carry development of the negative in each particular case. We may have exposed and developed correctly, according to the generally

accepted ideas of what is correct, but we may then find that one such negative is more effective when printed to give contrast, while another calls for a printing process of just the opposite kind.

In the last twenty or thirty years there has been a gradual alteration in the character of the negatives produced, the tendency being all the time to make negatives softer and softer. Many a photographer doing first-rate work today simply could not make a good print from the kind of negative in vogue a generation ago, while the modern negative to the old-time photographer would seem hopelessly weak and flat. Some of this must be put down to a gradually increasing estimation of delicacy and softness in our pictures, but this accounts for only a little of it. Some of the old albumenized paper prints were beautifully delicate and harmonious. The greater part of the change is due to the introduction of printing processes requiring soft negatives. Some of the special development papers which have been introduced in the last few years for professional use need negatives specially made to suit them in this respect, if the full capacity of the paper is to be brought out

The amateur today makes use chiefly of three processes only—P. O. P., gaslight, and rapid bromide paper. A negative of full contrast is what is required for P. O. P., whether of the self-toning or of the separately toned kind. Failing that, rapid bromide paper can be used for contact printing, or one of the special gaslight papers made to give soft results, the so-called "portrait" papers. For softer negatives still, the ordinary gaslight paper can be used, while special gaslight papers are made which will give quite bright results from negatives which are too thin to give presentable pictures in any other way whatever.

To get the best results out of all one's negatives even if these do not include any that are excessively harsh or thin, more than one paper must be used; and it is well to recognize this, and if any packet is found to give specially bright or specially flat pictures, not to use it indiscriminately, but to keep it for use when one or other quality

is needed.

It is not recognized as generally as it might be that, even with the same brand of printing paper, different batches differ very decidedly in the character of the gradation which they yield, and these differences have become more noticeable since war conditions have compelled manufacturers to find fresh sources of raw material. We put the following question the other day to one of the largest users of bromide paper in this country: "Which brand of bromide paper in your experience gives the strongest contrasts and which the weakest? His reply was to the effect that he could not say that any one brand could bear either description; but that certain samples of certain brands had possessed such a distinction, and that when he found a paper which gave unusual contrast or unusual softness he put some of that particular batch aside for special work. But it was not safe to assume that any other batch of the same paper would necessarily have the same characteristics. The makers themselves recognize these differences, and we may be quite sure are alive to the importance of keeping them down to a minimum, in the interest of the reputation of

their product for uniformity.

It is not only in the choice of the medium itself that we can control the gradation in the print: there is its treatment to be considered. The character and strength of the light by which contact printing is done have an important influence on the result. A very thin negative, for example, will give a much more brilliant print if the exposure is made to a feeble light than to a strong one, and using the same illuminant and the same paper, a greater degree of contrast is got by using an enlarging lantern than by contact printing. There are also special methods for getting soft prints from harsh negatives, while soft negatives can be made to give strong prints by first making the print, fixing, and washing it, and then bleaching it, as if it were to be sulphide toned, and then redeveloping it. In that case a second fixing is not required.

On the whole, such processes are not of much use: it is simpler and more satisfactory to rely upon two or three different qualities of a development paper, and to aim at getting all our negatives well within the range of such stock as we possess. In that way we can be sure of doing the best in each case, and doing it without much waste of either time or materials in experimenting which these special processes generally involve.

—Photography.

A Use for Old Bromide Paper

THERE are a few professionals who find themselves on occasion with a stock of bromide printing-paper on hand, which from one cause or another-light-struck, too etc., etc.-has been laid aside for the residue collector; but we have recently heard of a photographer who finds himself able to utilize it in his daily work— for printing rough proofs, which in a large business involves the expenditure of no inconsiderable amount of printing-out paper. readers would naturally say, upon reading this, that the saving is not worth the extra trouble of developing, etc.; but this we may say at once is not involved. The new plan is simply to make use of the old stock as a printing-out paper. The method of procedure is an ingenious adaptation of an old dodge with albumenized paper. Those of our readers who have been photographers long enough to have been graduated in printing on albumen paper—now almost entirely out of date—may remember one method once recommended to avoid the inevitable browning which rendered the paper useless, consequent upon keeping it for a day or two. It consisted in washing all the free silver from the surface directly after sensitizing, after which the paper would keep good for weeks; but would take days or weeks, rather than minutes, to print. To make it available for this purpose, all that is necessary is to saturate it with the vapor of ammonia. The simplest method of doing this is to store it when required for use in an earthenware jar with a lid, first placing at

the bottom of the jar a saucer or cup containing a small quantity of strong ammonia solution (covered, of course, so as to prevent contact of liquid and paper). The lid also is made to fit almost air-tight by laying upon the mouth of the jar a piece of wide rubber cloth of the requisite size, pressing the lid upon it. Any old hand who was accustomed to the "fuming" of sensitized albumen paper, an almost universal practice, at any rate in England, years ago, will need no instruction about this matter. It was found that the washed paper, virtually insensitive before treatment, became quite as sensitive if well fumed as the ordinary untreated paper, with the added advantage of toning with perfect freedom of mealiness. It was observed, however, that the ammonia was apt to become dissipated before the printing was complete and the paper again became insensitive.

The photographer we speak of operates his old or waste bromide and gaslight paper in exactly the same manner; but, to avoid or minimize the loss of the ammonia during printing, instead of fuming the paper alone, he also fumes the thick felt pads of his printing-frames, quickly covering them with the rubber pads such as are used for platinotype-printing, but, of course, in the reversed position as regards pads and paper. He finds that the paper under those conditions prints out very satisfactorily, and further, with, at any rate, most brands, he is able to tone it as though it were ordinary printing-out paper if he so desire; though, as explained, his main idea is to employ the paper as a saving of printing-out paper, so commonly used for "rough prints."—Photo Era.

How to Secure Good Color and Brilliancy in Toning Bromide Prints

One's mind should be made up beforehand as to whether a bromide print is to be sepiatoned or not; and if it is, a somewhat greater depth should be aimed at than in the case of one which is to retain its normal color. This is best effected by giving a full but not a generous exposure and using a fairly strong developer. The drawback which has hitherto attended the sepia-toning process has been the yellowish tinge assumed by the high lights, robbing the print, as it does, of the sparkle which existed in its black and white condition; and a method of toning which will retain and, if need be, enhance the brilliancy of the picture should be welcome to all who employ bromide paper as a printing medium.

The bleaching bath for prints which are of the correct density is as follows:

Water							10 oz.
Potassi	um	feri	icy	anio	le		20 gr.
Sodium	ch	lorio	de				200 gr.

Sodium chloride as purveyed for the culinary department is of quite sufficient purity for the purpose. The print, being bleached in this solution, is washed for a couple of minutes and darkened with barium sulphide or ammonium sulphide (sodium sulphide, owing to its instability, should be banished from the photographic chemical cupboard).

In the process of bleaching the potassium ferricyanide attacks the metallic silver of the print, which is then converted into silver chloride. This is very slightly soluble in a solution of sodium chloride, which is present in this bath in sufficient quantity to act as a clearer of the high-lights, and hence we have a brilliancy which cannot be obtained by the use of the potassium ferricyanide and potassium bromide formula so universally prescribed. When it is required to reduce the general density the quantity of salt is increased from 200 to 660 grains and the bath used at a temperature of 60° to 65° F., prolonging the immersion, if need be, and as experience may dictate.

It is sometimes desirable to tone a bromide print to a rich sepia, but the original is gray in tone due to insufficient development. The ordinary sulphide toning bath in this case is apt to produce not only a bad color but to make the result look even weaker than before. A good plan under these circumstances is to adopt the method in which the bleacher contains mercury as one of the constituents. The resulting tones range from a rich engraving-black to warm brown. The following solutions are necessary:

A		
Potassium ferricyanide		1 oz.
Potassium bromide		$1\frac{1}{2}$ oz.
Water		9 oz.
D		
В		
Bichloride of mercury		1/4 OZ.
Potassium bromide .		$\begin{array}{c} \frac{1}{4} \text{ OZ.} \\ \frac{1}{4} \text{ OZ.} \end{array}$
Water		9 oz.

For securing rich black tones, make up the bleaching solution with 160 minims of A, 10 drams B, 4 ounces of water. With this quantity of mercury solution the print is considerably intensified in the toning process. For cool brown tones, use 160 minims A, 80 minims B, 4 ounces of water. After using these mercury bleachers, however, it is necessary to well wash the prints, and then give three consecutive changes of three minutes each in hydrochloric acid 1 dram, water 10 ounces. These acid baths are to remove the mercury solution, which would otherwise remain in combination with the gelatin. The bleached prints are toned in the sulphide solution.

Amidol, one may mention, gives the best results when making the black and white print; but the fact that this developer becomes useless after being mixed for forty-eight hours has prevented it becoming so popular in the hands of amateur workers as it deserves to be. By using amidol in an acid condition, however, the keeping properties of the mixed developer extend into months, and it thus remains excellent both for negative and bromide work. The stock solution consists of:

Water		4 oz.
Sodium sulphite (cryst.)		400 gr.
Acid sulphite solution		3 dr.
Potassium bromide .		5 gr.
Amidol		30 gr.

Mixed in the order given. The acid sulphite solution is made by mixing $\frac{1}{2}$ ounce sulphuric

acid in 8 ounces of water, cooling down by immersing the bottle in water and adding 4 ounces sodium sulphite (cryst.), shaking till dissolved.

This carries 6 grains amidol to the ounce, so that one part diluted with two of water provides a developer of the standard strength for bromide paper; for negatives 3 grains to the ounce is recommended. It is a mistake to commence the development of bromide enlargements with a full-strength solution; the process is under much better control and the results are of greatly improved quality if the operation is begun with a solution diluted to 1 grain amidol per ounce, this being reinforced from time to time as development proceeds by small additions of the stock solution until the required density has been attained.—Amateur Photographer.

Reversed Negatives or Positives by Ammonium Persulphate

A THINLY coated slow plate (such as a lantern plate) is placed in contact with a negative in the usual manner in a printing frame, and a very full exposure given; the plate is then developed with a clean-working developer such as glycin, and the development should be continued until the shadows (the blackest parts of the picture) appear absolutely black on the glass side of the plate—the time of development may take quite six times as long as when developing ordinary transparencies. As soon as the plate has been sufficiently developed, it is washed and placed in a 2 per cent. solution of ammonium persulphate until the entire silver image is removed; it is then thoroughly washed and developed again-in weak daylight or artificial light—with any clean-working developer containing, say 0.5 grain of bromide per ounce—and as soon as it is sufficiently developed as a reversed negative, it is washed, fixed, and thoroughly washed and dried. The action of the persulphate after the first development must be as complete as possible, otherwise a satisfactory result will not be obtained, through a "veil" forming all over the negative. It will be noted that the foregoing process produces a negative from a negative, and likewise a positive from a positive, and when it is required to produce the latter on paper, all that is necessary is to substitute bromide paper for the plate in the camera or printing frame, and thus secure direct positives, but reversed from right to left, from photographs, engravings, lantern slides, etc. The procedure for obtaining direct positives, enlarged or otherwise in the camera, is the same as given above—the whole secret of success being a full exposure and development. The process has a peculiar advantage of rendering lines in the same degrees of black and gray, which is important when reproducing engravings.—Amateur Photographer.

Storing Negatives

The problem of storing a large number of negatives confronts the photographer of today on many occasions. The following article, reprinted from the *British Journal of Photography*, offers a valuable suggestion and one that

if adopted may save life and property. We commend a careful reading of this article to all whose business is such as to entail the storage of a considerable quantity of glass at any one time.—[ED. P. J. OF A.]

Discussing, with a well-known member of the profession, the question of the various modes of storing negatives adopted by professional photographers, we were not a little surprised to hear him say that he did not think that the storage, at any rate of portrait negatives, was worth the trouble and expense involved, the public taste being so capricious that negatives were, save those of public characters, rarely needed for replicas, except in the case of a death, and that it was a poor game to keep thousands of negatives on the chance of some one or two of the originals dying within the next dozen years and their friends ordering half a dozen copies. This view, of course, could only be founded on personal experience, and to formulate a general rule from a particular instance would in the present case be rather illogical and very unwise. Further, it is obvious that, even granting the existence of a capricious public, the demand, or the absence of demand, for repetitions must be largely influenced by the character of the clientele. A business which relies mainly on chance sitters does not require any thought to be given to the storage question, while, contrariwise, one made up entirely by connection may find the gradually increasing store

of negatives to be a very valuable property. Speaking generally, however, there seems to be a consensus of opinion that the business of the portrait photographer has gradually been undergoing a radical change since the time when the production of a negative, from being an operation of some moment, became an affair of mechanical simplicity—as the production of the dry-plate has caused it to be. A sitter, then, was satisfied with a single proof, or he paid extra for further choice; now, he wants them by the half dozen, with retakes gratis, even for the comparatively limited number which we are told are usually printed for a single order. Hence, the negative is cheapened, in a sense, and its storage more costly, and the accommodation required more ample. Granting, however, for the nonce the need—or shall we say the desire?—to save negatives from which prints have been issued, it becomes a matter of some moment to decide how the storage can be best and most economically carried out. For this to be efficiently done it will be necessary that any particular plate required can be most readily found and handled with the least expenditure of time and labor before putting in the printingframe. It would not be possible to describe every method we have seen in use; but a brief reference to what have appeared to us most popular and desirable may be useful.

At the outset a word of warning must be

At the outset a word of warning must be given, as a case which occurred in the provinces some time ago showed was desirable. New upto-date premises were being erected, including an upper story for an accumulation of negatives. The building was not constructed satisfactorily, the walls were new, the negatives numerous and

weighty, the result, collapse of the walls through the weight being concentrated in the most unsuitable spot. Ten or twelve thousand negatives is not a large number for a business worked at "popular prices;" but they would weigh a ton. Fifty thousand would therefore weigh about five tons, and before such a weight was placed upon any floor whatever an architect should be consulted. It is not a question of what a floor ought to bear so much as what it is likely to be able to bear that has to be considered. We have in our mind an instance that we have come across where the most has to be made of a small room on the first floor. The negatives are ranged from floor to ceiling, the walls being entirely hidden, door and window being the only uncovered portions. Here a line of three-inch planks was placed on the floor all around against the wall, and the racks for the negatives were placed upon them, first, with the object of distributing the weight, and next, to prevent the racks becoming legal "fixtures," to effect which they were simply kept in place by being wedged against the ceiling rafters. Then, in the room below his negative room, and without cellarage, a similar line of planks was placed, and on them were erected other planks as pillars supporting still others pressed against the ceiling rafters. Thus the whole weight of the negatives rested upon the solid earth, and, being kept in a perfectly perpendicular arrangement of weight, there was virtually no tendency to side-thrust to endanger the walls. All these precautions were considered on account of the studio proper being, as often happens, an added story to what at the outset was a two-story building.

To complete our description we should add that there was a similarly supported beam placed under the middle of the room and reaching from side to side to receive the weight of a central erection in the negative room, and which con-

tained a large number of plates.

We have felt justified in describing this particular example at length, and in laying stress upon the necessity of precautions being taken to ensure the stability of premises where a large number of plates may probably accumulate, from a feeling that the matter is one that may be readily lost sight of in the growth of a business, and, further, that the result of want of foresight might bring about pecuniary disaster, or, what would be infinitely worse, danger to human life in the case of a collapse similar to the one we referred to.

Working Collodion Papers

THE consumption of paper coated with a sensitive collodion emulsion at the present time is enormous, and, consequently, difficulties arise that are inevitable. It is well to know how to correct these difficulties when they occur, and if possible to avoid their recurrence. It must not be thought that these difficulties have only occurred in recent years. They have been known ever since the first introduction of a printing-out collodion emulsion, in 1864, by the late George Wharton Simpson. Collodion paper is now being used to an extent hitherto unknown, both in quantity and size of the prints, the result being that methods of handling and manipulating have been adopted to meet the demand in producing this class of photographic print

that differ from the original plan.

To be sure of the very best results, with no loss of prints by yellow stains, there is no better plan to adopt than to employ a moderate-sized tray with a glass bottom to lightly squeeze the prints upon previous to washing and toning. Such trays have been used by the writer with complete satisfaction since 1876; being made originally as sensitizing trays for albuminized paper, they have proved to be the cleanest trays for nearly every kind of photographic use.

Dark spots upon the face of the prints, varying from the size of a pinhead to a split pea, are caused by the imperfect wetting of the surface of the print before laying it down upon the tray to be patted flat, or squeegeeing. The result is that those parts that are left dry do not receive the thorough washing that the rest of the print receives; consequently, these spots take a heavier deposit from the gold baths and show up very prominently, causing all such prints to be spoiled and wasted. When the prints are placed in a tray of clean water, previous to flattening them down upon the bottom of the glass tray, be sure that their surfaces are well wetted and evenly; then there will be no trouble from this source.

Black specks also occur upon the surface of collodion prints by the careless use of magnesium powder. If this material gets upon the table or bench, or in the trays where the prints are first wetted and flattened, innumerable black spots will occur, because the metal magnesium, being a high electro-positive element, will at once cause a reduction of a trace of free nitrate of silver to the metallic state, and such spots once formed cannot be eradicated except by scraping. To avoid this difficulty, see that the mixing of magnesium powder is carried out in another room, or at a part of the room remote from where the prints are handled.

Blistering of the prints is caused in most instances by using the toning baths and wash waters at different temperatures. The main body of the paper absorbs water more freely than the collodion surface, which is almost non-absorbent. This is why the prints must be allowed to lie flat from twenty minutes to half an hour while wet to allow the collodion surface to expand with the paper and thus prevent

curling.

Blistering is also caused by allowing the prints to remain for too short a time in the salt bath when taken direct from the hypo-fixing solution. Fifteen minutes is a safe time for the prints to remain in the salt bath, and even more time than this does no harm. The hypo-fixing bath should never be warm; if it is, blistering will be sure The main point here is to keep all the solutions that are used for the gold and platinum toning as near the same temperature as possible, and the fixing bath in particular.

There is oftentimes a difficulty in getting the prints to tone, or to tone evenly. This can be overcome by employing in the second wash water four ounces of carbonate of soda solution, measuring 60 on the hydrometer, and mixed with four gallons of clean, cold water. This is just about the right strength to neutralize any excess of the acid qualities of the paper. Give the prints five minutes in this bath; then wash in four changes of water; allow the prints to remain in the fifth wash water face up, because this will aid in keeping the prints flat—in fact, in all the operations from this time on until the final washings, the prints should be treated face up.

It will be found that if all the prints are treated with the carbonate of soda bath the toning of the image will take place readily and with excellent uniformity. In making the gold toning bath alkaline always prepare the borax solution from the crystals. Place half a pound of crystal borax in a clean, wide-mouth bottle; pour upon it a quart of hot water; shake the bottle well; stand aside for general use. This will give a saturated solution, and may be used either warm or cold. Be sure to test the toning solution with red litmus paper. When the paper turns only faintly blue the bath is then in good working order and will give good, uniform tones.

Each day, in using this bath, pour only twothirds into the tray, and pour the remaining solution into a stoneware crock, into which a handful of protosulphate of iron has been placed. Pour also all the extra platinum solutions into the same crock, stirring up occasionally. When this is quite full and the sediment settled, pour off the clear liquor, continuing until there is a quantity of sediment. This will contain the gold and platinum, ready for the refiner. Make up the gold bath to the original quantity by fresh gold solution and borax. By this means the activity of the toning bath is kept up and good

To prevent any staining of the prints, especially at this stage, always use a clean towel to wipe the hands upon. Should a towel be used that has been used in the dark-room, and contaminated with pyro or any other developing agent, yellow and brown stains will surely result, which only too often are attributed to the hypo, simply because these stains do not become manifest until placed into the hypo solution. Care and cleanliness are very essential at these stages because a great deal of work can be spoiled during these operations. These apparent difficulties can be avoided by the use of towels that are used by no one but those who do the toning and fixing, and thus become contaminated with nothing but the material used in the toning operations.

One of the most trying of operations in the use of collodion paper is the platinum toning. Here the phosphoric acid that is used attacks the skin of the wrists of each hand, at times producing extremely painful sores; so much so that some men are compelled to abandon the work for that reason. [One important item must be pointed out here: The prints must be well washed in two or three changes of water after the gold toning, so as to rid them of all trace of the borax, which would upset the platinum toning entirely, always bearing in mind that the gold toning bath must be alkaline and the platinum toning bath acid—these are essential qualities for the right depositing of these metals.] The action of the toning baths upon the fingers and wrists, the writer has found from experience, can be avoided by using a liberal quantity of vaseline well rubbed over the wrists and fingers of both hands, the hands being wiped well with a clean piece of muslin or a soft rag. After the operations of washing have been done, previous to toning, the prints then being well wetted will resist anything of the faintest greasy nature. Although the hands and fingers are wiped fairly dry from the vaseline, a moderate quantity can be left upon the wrists. This plan effectually prevents sores being formed, as is so often the case when the bare hands are used.

After toning in platinum is complete, and the fixing, salting, and washing operations have been gone through, there will be found some prints that are too dark and will not match with the others. This often occurs with large prints. When this is the case, do not throw these prints away, but make up the following solutions:

	N	Jo.	1			
Potassium io Iodine .	odide					$\frac{1}{2}$ OZ.
Iodine .						$\frac{1}{2}$ oz.
Water .						16 oz.
No. 2 Pure potassium cyanide (99 per cent.) $\frac{3}{4}$ oz.						
Water						$\frac{3}{4}$ OZ.

When all the salts are dissolved, add No. 2 to No. 1; a bright, clear liquid will result; mark this "stock solution," mix two ounces of this with eight ounces of water; place the dark print into this for a short time; reduction will soon take place. When nearly reduced, dip the print into the usual hyposulphite fixing solution; reduction will rapidly take place without change of color. The print can then be placed into the salt bath and washed well and mounted while wet or dried and trimmed. The mixture can be used over and over again. Both bottles must be marked "poison," if for no other purpose than to prevent accident. No trouble need be feared from the use of this material from its poisonous nature; carefulness in its use is all that is necessary The hands being well washed in clear water will free them of any trace of the reducer.

Plain Salted Paper

For the artistic worker, particularly in large sizes, plain—or, as it is sometimes called, salted plain—or, as it is sometimes called, salted—paper is extremely valuable, as any surface or texture can be used, and, by variation in the salting solution, it may be made suitable for all classes of negatives.

As regards the choice of paper for smooth surfaces, Rives or Saxe may be used, and for rougher surfaces any good drawing paper may be chosen; but it is always advisable not to keep these too long after sensitizing, as there is a chance of their turning yellow; still, as any quantity can be "salted," and as they will keep indefinitely in this condition, it is no hindrance to their use.

to their use.

The term "salting" is literally correct, as this is actually the providing of the paper with a chloride salt, which is later decomposed into silver chloride when the paper is sensitized; but with the salting solution it is usual to employ

some colloid, such as arrowroot, starch, or gelatin, which prevents the silver solution from sinking too deeply into the paper and thus prevents the

print from being flat and dull-looking.

The best size is certainly arrowroot, or, at any rate, it is easier to use than any other. A drawing board or other flat surface is required, as well as some brushes. One of these should be a flat sable-hair brush of not less than three inches wide, and the hairs about an inch and a half long; the other should be a hog's-hair stippling brush. It is important to note that neither must be bound with metal.

While it has been advised above to use a drawing board—and this is useful for large sizes it will frequently be found more handy to use a sheet of glass in the following manner: Pin the paper down to a board or table with two goodsized drawing pins; lay the sheet of glass so as just to cover the pins; then turn the paper over the glass, and pin down at the other end beyond the glass. This gives one a raised surface, on which the sizing and salting solution can be easily brushed, and the paper can at any time be lifted by drawing out the two bottom pins, and it can then be strained anew, which is very frequently necessary, as it cockles as soon as the warm size is applied, and it is necessary, if good results are required, to re-strain the paper. This wastes a little paper, but that is far preferable to finding when printing that certain parts are less rich than others, which may very easily happen if the paper is merely pinned flat to a board and then left. By this method of working, too, the paper is kept much cleaner, and there is but little waste, and one can control completely the amount of salts and size to any given area, which is not possible when the paper is floated.

Salting the Paper. It will be found most con-

venient to incorporate the salts with the sizing solution. The chief salt used is a chloride, and if a citrate be used as well, a longer scale of gradation is obtained. Then, again, one may shorten the scale of gradation, or, in other words, obtain pluckier prints by adding a small quantity of potassium bichromate, or the scale of gradation be increased and the prints flattened by using a little phosphate of soda. It is obvious, then, that by preparing one's own paper there is a

great command over the results.

A satisfactory salting and sizing solution may be made as follows:

Arrowroot	192 gr.	40 gm.
Ammonium chloride	144 gr.	30 gm.
Citric acid	15 gr.	3 gm.
Sodium carbonate	30 gr.	6 gm.
Water	10 oz.	1000 c.c.

Rub the arrowroot into a thin cream with about an ounce of the water, and then add slowly in a thin stream to 7 ounces of the water, which should be briskly boiling, and stir well, and continue to boil gently for about five minutes, or until a perfectly clear jelly is obtained. Dissolve the salts in the remaining 2 ounces of water, and then add to the arrowroot and allow to cool. There should be no necessity to filter this, but if this is considered desirable, or is necessary on account of lumps, which will be due to faulty

manipulation, then this must be done while the solution is warm.

To make the above work with greater brilliancy, add 1½ grains of potassium bichromate, while to make it give flatter prints add 2½

grains of sodium phosphate.

The correct quantity of above solution for any given sized area of paper is very easily calculated for every square inch will require half a minim of solution; so that, if we are sizing a sheet of paper 12×10 , we should use $12 \times 10 = 120$ $\div 2 = 60$ minims. It may possibly at first be found a little difficult to coat this evenly, in which case the operator may add a little more water if he thinks fit, but with a little practice

this will be found ample.

Sizing the Paper. To apply this size measure out the required quantity, and pour on to the middle of the paper; then with the flat brush rapidly distribute the solution over the whole surface of the paper, passing it rapidly up and down in one direction; then if the paper cockles, re-strain it, and then use the brush in a cross direction to that at first used. As soon as the liquid seems evenly distributed, use the round brush, and, holding it almost perpendicularly above the paper, work it over the entire surface with overlapping circular strokes till the paper is surface-dry, and then hang up in a warm place to dry.

There is one size which, while a little trouble to use, is extremely happy in results, because it has no tendency to sink into the paper, for it does not dissolve, but merely forms a jelly, which has to be worked into the surface of the paper. This size is agar-agar, and 5 grains should be allowed for every ounce of water, and soaked for an hour, and then boiled till it forms a perfectly clear jelly; then add the salts, and filter while warm through a piece of soft linen—and there is nothing so good as an old cambric handkerchief —and then allow to set. When thoroughly set, it should be broken up small by squeezing it two or three times through fine muslin.

The required quantity should be measured out, and thoroughly worked all over the surface of the paper till it presents an even surface, and then it should be hung up to dry. Arrowroot may be combined with the agar-agar, and the solution is then easier to work; in this case, the quantity of both the arrowroot and agar-agar given above should be reduced to half.

Gelatin is one of the most difficult sizes to use. as it forms innumerable little bubbles, and the solution so rapidly sets that it is difficult to work. Besides that, if gelatin is used, the prints are not so suitable for platinum toning, which is par-

ticularly desirable for plain paper.

Sensitizing the Salted Paper. As regards the sensitizing of the paper I strongly recommend the adoption of a similar plan as already advised for sizing. The paper can be floated on the silver solution, but this plan necessitates the use of a fairly large quantity of silver solution; this, too, is apt to get out of order, as it takes up some salts from the paper; it is weakened after every sheet, so that, unless one tests the bath, one is apt to find that those sheets sensitized at the end are weaker and flatter in printing.

If the paper is to be kept, then some citric

acid should be added to the sensitizer. Considering the ease with which the paper can be sensitized, this, however, is not a procedure I recommend, unless the paper is to be kept more than a week; then citric acid may be used, but it must never exceed one-third the quantity of silver nitrate.

Our sensitizing solution, therefore, becomes:

Or	Silver nitrate Distilled water to	80 gr. 1 oz.	160 gm. 1000 c.c.
Or	Silver nitrate	80 gr.	160 gm.
	Citric acid	20 gr.	40 gm.
	Distilled water to	1.02	1000 c.c.

Precisely the same quantity of this solution should be allowed to the same area of paper as advised above for sizing—that is to say, 60 minims to 120 square inches. It should be

applied in precisely the same way too.

It is sometimes advised to make an ammoniacal solution of silver, on the ground that this makes the paper more sensitive and gives richer prints. If this is desired, then the citric acid must be omitted, and enough strong ammonia .880 added to the silver nitrate solution to dissolve the precipitate first formed. As, however, this paper will not keep longer than twenty-four hours, and exactly the same results can be obtained by fuming the paper, when sensitized with the plain silver solution, I do not advise it.

There are innumerable variations of the above formulæ, but the only one that is at all valuable,

in my experience, is the following.

The formula is recommended by Thullier, and is rather complicated. He recommends immersing the paper, but equally good results can be obtained by incorporating the salts with the size and applying with a brush. The solution then works out thus:

Sodium phosphate	192 gr.	40 gm.
Borax	96 gr.	20 gm.
Sodium carbonate	48 gr.	10 gm.
Sodium chloride .	24 gr.	5 gm.
Potassium bichro-	0	8
mate	005 gr.	0.01 gm.
Water	10 oz.	1000 c.c.
Arrowroot	192 gr.	40 gm.

The method of making this is precisely as described above, only the bichromate must be added last.

The sensitizer for this differs slightly from that given above, and should be:

Silver nitrate	. 80 g	r. 160 gm.	
Lead nitrate	. 80 g	r. 160 gm.	
Distilled water	1 0	z 1000 c.c	

This must be neutral, and, if not, a grain or two of carbonate of soda should be added.

This gives really good sepia tones by mere fixation in an alkaline hypo bath, but with platinum toning rich blacks are readily obtainable.

Matt Albumin Paper. Another method of preparing this paper is suggested by Von Hübl, and it gives results which are intermediate between albuminized and plain salted paper. The idea is excellent, as one may ring the changes considerably with corresponding variations in the surface of the final prints:

White	of (egg			1 oz.	500 c.c.
Arrow	root	t so	luti	on	1 oz.	500 c.c.
Salt					30 gr.	30 gm.

The albumen must be whipped to a froth, as already described, and allowed to stand twenty-four hours to clear. The arrowroot solution must also be made as described, and then, when the temperature of the latter has sunk to 90° F., the two solutions should be mixed; it can then be brushed on to the paper.

The sensitizer for this may either be a plain solution of silver nitrate, or the above-given formula with half the amount of citric acid.

As regards printing on plain papers, the negative must be fairly plucky, unless the paper has been specially sensitized with bichromate to obtain vigorous prints. As to the exact depth of printing, this again is to some extent dependent on the paper, the toning bath, and the color required. If very deep rich purple and black tones are required, then printing must be carried on till the highest lights are fairly deeply stained.

Before toning, the prints should be immersed without washing into a solution of salt and water, about a quarter of an ounce to the pint of water, and kept on the move for five or ten minutes, and then rapidly washed, and they are ready to be

toned.

Toning. Any toning bath may be used, but great care must be taken not to use it too strong; if gold is used, it should not be stronger than 1 grain to the pint. One of the simplest of all gold toning baths is the following:

Chloride of gold .	1 gr.	0.1 gm.
Precipitated chalk	$\frac{1}{4}$ OZ.	12.5 gm.
Water	20 oz.	1000 c.c.

Shake well, and allow to stand till clear, and then use the clear portion.

All gold baths tend to give purples and purple browns; sepias and brownish blacks can only be obtained with platinum. This bath, too, must be used fairly weak, and the following formula will be found satisfactory:

Potassi	un	1 C	hloı	ro-		
plati:	nit	е			2 gr.	0.2 gm.
Dilute	pl	hos	pho	ric		_
acid		. '			$\frac{1}{4}$ OZ.	12.5 gm.
Water					20 oz.	1000 c.c.

It is absolutely essential that the prints be treated to the preliminary salt bath, and that they be thoroughly well washed before fixing.

Very fine tones can be obtained by first immersing the prints in the chalk gold bath given above till they just begin to change color, and then well washing and toning in the platinum bath. With deep printing very rich warm blacks are obtainable by this method.

The fixing bath for plain paper prints should never be stronger than 2 ounces of hypo to the pint, and a little carbonate of soda should be added, so as to insure its alkalinity. Provided the fixing bath is of the correct temperature—that is, about 65° F.—five minutes' fixation will be enough for ordinary papers, while for thick drawing papers ten minutes will suffice, particularly if plenty of solution be used and the prints are kept on the move.

The after-washing of plain prints should be precisely as indicated for albuminized paper.

The great danger with plain paper is that the image may be sunken-in, flot and gray, and this is very frequently caused by too strong toning and fixing baths; but if this point be attended to, there is no difficulty in preparing the paper, and the results make a welcome change from the iaterminable round of P. O. P.

The greatest advantage of the process, however, lies in the fact that any surface can be obtained; that one has also immense command over the print by varying the salting and silvering solutions, so that the paper can be adjusted to

every possible class of negative.

Stripping Film Negatives

STRIPPING the film from a glass negative is a totally different procedure from stripping the film from a celluloid cut or roll-film, and as the production of film negatives is now as popular or even more popular than glass plates with the present-day watch-pocket hand-camera enthusiast, a rough description how to strip a film negative successfully will possibly be of some interest.

The following should be made up first:

Caustic sod	la				10 gr.
	ıa				
Formalin					10 min.
Water .					1 oz.

The film negative should be placed in a clean tray and allowed to soak in the above solution until the film shows signs of detachment; it should then be transferred to another dish containing:

Hydrochlo	ric	acid			25 n	nin.
Glycerin					25 n	nin.
Water .					1.0	7

The film should by this time be in a state to be rolled off its celluloid support with the finger, and transferred to its new support. No time should be lost in the latter operation, as the stripped gelatin film is apt to enlarge, and thus alter the original printing density of the negative.

If it is intended to employ glass as the new base, it should be thoroughly cleaned, and the stripped negative and the glass should be brought into contact with each other under the surface of the hydrochloric solution, in order to avoid airbells forming between the film and its glass support. The glass with the stripped film gently held in position with a finger should be very carefully removed from the tray and drained, and as soon as the film has adhered to the glass, the whole may be gently rinsed in water, and placed in the plate rack to dry in a place free from dust.

A support slightly larger than the stripped negative should be used to allow for a slight increase in the size of the stripped negative. This tendency on the part of the stripped film, to enlarge can be taken advantage of sometimes if a slightly larger image is required.—A mateur Photographer.

An Extra Hardener

During the hot months the dark-room is very liable to start trouble. The ice may go too quickly, the fixing bath may not take hold right, trouble may come from anywhere or nowhere. And it does come in the best-regulated dark-rooms where a strict adherence to rules is the order that is obeyed. And yet the film will get soft and scratch or a stain will appear. Just summer complaint, it is true, but aggravating and wasteful just the same.

"Preparedness" yourself with the following:

Water			6 oz.
Acetic acid .			4 oz.
Alum powdered			1 oz.
Sodium sulphite			1 oz.

Label it "emergency hardener" and place on a shelf handy. At the first sign of trouble, reach for it and be sure that you can lay your hand on it every time. It is primarily for use after coming out of the fixing bath, but in case of dire need can be used at any time between the rinse water after development and the final drying. It will cost just a few cents and may save you a few dollars several times through the hot weather. —Trade News.

Exposure Tips

Exposure. With Seed plates the latitude of exposure is usually about two. That is to say, if one second were the normal exposure, plate would stand a two-second or a half-second exposure without being too much over or under exposed.

Light varies in intensity from hour to hour during the day and from month to month during the year. In winter, exposure during the middle of the day should be from two to four times longer than at the same hour of the day in midsummer. Exposures made near sunset at any season of the year would require from five to ten times longer than at noon of the same day.

Correct exposure gives a well-balanced image in which the detail of the shadows is fully brought out before the high-lights are over-developed.

Transparent mottling is due to negative having partially stuck to the glass side of another plate during washing and when pulling apart caused the emulsion to partially lift.

Overexposure produces lack of contrast. If development is carried too far, negatives will have too much density and shadows and half tones will be clogged. Such negatives will be slow printers and the resulting prints would lack brilliancy.

Halation occurs when strong lights are brought opposite dense shadows. It is frequently seen in the case of white draperies on a dark background. It also occurs in view negatives when dark objects are photographed against a bright sky. When photographing dark interiors, halation shows as a spreading of the light from the window. Various remedies have been suggested for halation, but the best preventative is the use of a double coated or non-halation plate.

Mottled yellow stain is caused by negative or paper being slightly damp when printing proofs. Discoloration is a silver stain from the paper. Be sure that negative and paper are both perfectly dry when proofing.

Replies to Queries

G. Sandwell: You ask whether amyl-acetate collodion may be used in lien of ordinary collodion for photo-engraving. Ans. No, it cannot. The rapid evaporation of the ether when a plate is coated, causes the quick setting of the film, which is necessary before placing it in the nitrate

of silver bath.

E. Peters: Your query as to whether pyrogallol may be substituted for the usual developers for paper prints. Ans. Pyrogallol is unsuited for the present-day paper prints because of its staining property, due to rapid oxidation. A fine print may be developed with pyro, but it will give unpleasant brown prints, is slow in working, and quickly stains.

PATENT NEWS

Under this heading it is proposed to include each month a list of all the U.S. Patents; and brief abstracts of the more important, and to include also such foreign patents as present special features.

Copies of any patent can be obtained from the Commissioner of Patents, Washington, D. C.

Price, five cents each.

Moving-picture Machine. Herman E. Roys. 1240882.

Autographic Camera. Roy Wilmot. 1240910. Support for Motion Picture Films. Delmas. 1240954. Anne M.

Photographic Exposure

MacCurdy. 1241133. Automatic Camera. A. J. Mottlan. 1241650. Camera. Melvin L. Levery. 1241773. Shelter for Moving-picture Machines. Theron

Meter.

John T.

Davis. 1241828.

Camera. George A. Goodson. 1241843. Moving-picture Machine. Ralph W. Martin. 1241869.

Exposure Signal and Film Guard. August Droste. 1242157.

Plate and Plate-holder for Moving-picture Apparatus. Gianni Bettini. 1242416.

Motion-picture Projecting Machine. Frank L. Dyer. 1242428.

Method of Producing Moving-picture Cartoons.
Max Fleischer. 1242674.
Attachment for Moving-picture Machines.
Harry Siegel. 1242730.

Camera. Edwin W. Tucker. 1242745.

Moving-picture Machine. A. F. Gall and N. A. 1242792. Curtiss.

Photographic Printing Machine. Fred W. Barkley. 1243685.

Means for Focussing for Use in Connection with Film Cameras. Edwin F. Harper. 1243934.

Process for Improving Photographic Negatives. Abel Bonlaran dit Deval. 1245152. A process of improving photographic negatives, which consists in intensifying the negative; printing a silver positive therefrom on a transparent support; coating the front face of the positive with a thin layer of colored bichromated gelatin; drying the coated print in the dark; exposing the positive to light at its support side; developing the negative thereby produced on the bichromated gelatin layer; immersing the print in a bath to cause the intensified silver image to disappear; and washing and drying the negative.

Moving-Picture Machine. 1245755. Anton Mehlfelder.

Film-packed Camera. Harold P. Moxon.

1245760.

Method of Making Cinematograph Color-films. John Edward Thornton. 1245822. A method of producing two-color value positive pictures for cinematograph films, which comprises printing two-color positive pictures of different color values in succession on a single strip of transparent film from a single strip of negative film having the picture negatives of different color values arranged in alternating sequence thereon, the alternating picture negatives of one color value being printed in direct sequence on one side of the postitive film and the pictures of the other color value being printed in direct sequence on the opposite side of the positive film, the pictures on opposite sides of the positive film registering, and subsequently coloring the pictures on the positive film in the correct color.

Cinematography. Wm. B. Wescott. Film-developing Apparatus. Don R. Winslow.

1245848.

Motion-Picture Camera. Franklin H. Avers. 1245856.

Photographic Shutter. Paul J. Marks. 1243086. Motion-Picture Camera. C. J. Coberly.

1243262. Movable Camera Support. C. L. Duhem. 1243272

Winding Device for Roll-film Cameras. Paul Dietz. 1243270.

Developing and Fixing Tank for Photographic Films. Geo. Hanlon. 1243403. Camera. Henry Hafner. 1246263.

Combined Support and Camera. A. C. Rutzen. 1246328. amera. Wm. D. Blair and Wm. J. Wright.

Camera. 1246531.

Mask for Making Photographic Prints. Chas. W. Wilson. 1247051.

Moving-Picture Machine. Thos. H. 1247786.

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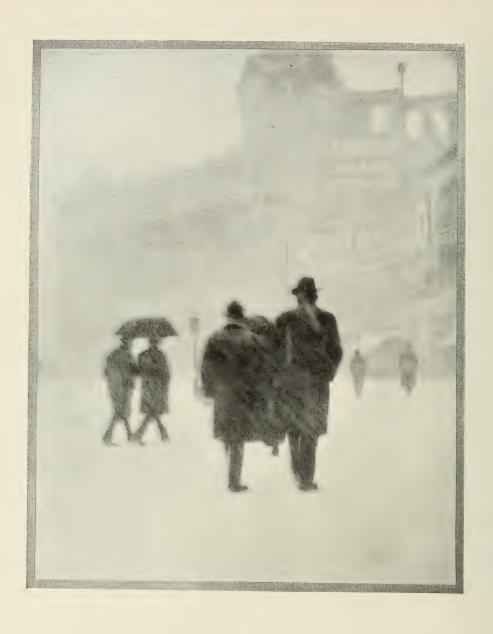
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LANTERN SLIDE MAKING

By H. R. NEWTON

I. Slide Making by Contact

MONG the occupations of the winter months lantern slide making takes a prominent place. The advantage of seeing one's work on a large scale, with a richness and range of tone which no print on paper can by any possibility attain, is no slight one; and each photograph so projected gains by the fact that it is seen by itself, with no distracting surroundings whatever, and can be so seen in comfort by a number at a time. Now that various forms of light for lantern purposes are so easily attainable, so that lantern exhibitions on a small scale can be arranged at home without all the paraphernalia of limes, cylinders, etc., the amateur photographer who can by any means afford to do so is wise to add a lantern to his equipment. As it can also serve for making enlargements, it is doubly useful.

The two methods of slide making, by

contact and by reduction, only differ up to the point at which the development of the slide is put in hand; the after-processes are identical. It has been a debatable point in the past whether slides made by reduction, or, more correctly, made in the camera, are not better than those made by contact; but it may be taken for granted now that the difference, if any, need only be infinitesimal and quite unnoticeable, provided the original negative is of the right size and the work is done with due

The essential weakness of slide making by contact is that it tempts the photographer to allow the size of his picture to be dictated by the dimensions of the lantern slide. One cannot look at many collections of miscellaneous slides without finding examples which proclaim the fact loudly enough that the photographer in taking the original never intended his picture to be trimmed in the way it is shown on

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the sheet. This is particularly the case with work done in quarter-plate cameras. The quarter-plate is distinctly too large for good slides to be made from it by contact, if the picture was originally arranged to occupy the area of the quarter-plate nicely. Hence we see slides in which the subject is uncomfortably crowded on, or in which important points have to be masked right off. With larger sizes than quarter-plate the effect is less marked, because the difference between such sizes and lantern size is so great that the picture on the slide is necessarily only a portion of that on the original negative. Even $3\frac{1}{2} \times 2\frac{1}{2}$ negatives must have been furnished with a good margin if they are to be printed as slides by contact.

The standard dimensions of the lantern slide in this country are $3\frac{1}{4} \times 3\frac{1}{4}$. The binding strips necessarily encroach a little on this, and one may therefore take it that the longest side of the picture on a lantern plate must not exceed 3 inches. Only negatives which have their picture on such a scale should be made by contact; if it is at all larger, then they should be put aside for slides to be made from them by reduction. If the photographer has some form of reducing camera—it may be quite a simple one—this is hardly any more trouble than contact printing: and if he has not, it does not require much ingenuity or much labor to adapt a camera to the purpose.

Slide making by contact is merely printing on glass instead of on paper: and the resemblance is made particularly close by the fact that lantern plates can be bought which are coated with exactly the same emulsion as is used on paper for printing, and which can be developed with the same solu-tions. The beginner who is using a paper for his prints of a brand which can also be obtained on glass may well make his first attempts at slide making in this way, though later on it is probable he will select one of the special lantern plate emulsions for the work.

There are two forms of lantern plate, and most of the leading manufacturers supply both. One of these is suitable for black tones only; the other, while

giving just as good black tones, can also be used for slides in warm tones by no additional toning method, but by mere modification in development. Plates of the first mentioned kind are more rapid than the others, and, on the whole, are the better for the novice to use. The method of getting warm tones by development, although not to be called difficult, is distinctly more tricky than the comparatively straightforward black tone method.

It may be asked why warm tones should be got in this way in the case of lantern slides, when with prints it is seldom used; why should not warm toned slides be made by a process of toning? The answer is that slides can be, and often are, made in which a brown or sepia color has been got by toning; but that, on the whole, the development method gives a richer and purer effect. It must not be forgotten that the slide is seen by transmitted and not by reflected light, and that the color of a substance may be quite different in the two conditions. This is brought home very forcibly when lantern slides are tinted with water colors. There are many pigments which have and distinctive color when applied to paper, but which when put on glass and looked through appear merely gray or black. The image of a lantern slide, if it is to appear of a warm tone on the screen, must be made up of some material which is warm in color when looked through; and it will be found that this condition is observed most effectually in the case of an image on a slow lantern plate, which has had a very full exposure, and then has been developed to the right point with a strongly restrained developer. The makers of lantern plates for warm tones issue with their goods formulæ for obtaining such tones, so that there is no need to repeat them here. It is best to use the developers recommended by the makers, and also not to attempt to get widely varying colors at first; but after learning how to get black tones, to take up, say, brown and to master the production of slides of that color before going on to purple or to red. One strong reason for this advice

is that it is difficult to judge the density correctly when going from one color to another; so that it is best to get to understand one quite thoroughly first.

Although lantern slide making by contact is practically printing, there are certain minor differences which must be noted. One is that the results when shown in the lantern will be on a greatly enlarged scale, and therefore any slight defects which might be overlooked in the case of a small contact print will be enlarged, and may become very conspicuous in the slide. It is therefore important to select only very perfect negatives for slide making; for few amateurs have skill enough to spot a negative so that the spotting will not be noticeable in a contact slide from it. For the same reason, great care must be exercised in making the print. We have to deal, not with a flexible yielding surface like that of paper, but with a rigid glass one both of negative and lantern plate, and any slight grit between the two will grind into the lantern plate and leave a mark. For this reason, we must see to it that the negative is perfectly clean, and that the lantern plate is put down upon it exactly as it is to be printed, and not slide about.

There are special printing frames for lantern slide making, in which the negative is held in position by the back of the printing frame, in the center of which is an opening the size of a lantern plate. The negative is adjusted under the back, until precisely that part of it which is to appear in the lantern slide is seen through the opening in the back, and is then fastened in position. This form of frame is only applicable in the case of negatives which are larger than lantern plate size. It is a convenience, but is not indispensable.

When printing from negatives which are the same size as the lantern plates or smaller, or from film negatives, the printing frame must be provided with a sheet of glass. Between the negative and the glass it is best to put a black paper mask the full size of the frame, with an opening in it the size of a lantern plate. It is then easy in the dark-room to adjust the lantern plate over

this opening, and to place it straight down in the correct position at once. If the negative is smaller than a lantern plate, the mask should extend right up to the edges of the negative, so that there is no clear glass visible round it, which might result in slight fogging of the margins of the slide. As lantern plates are not very sensitive, one can use a good yellow light in the darkroom, so that no difficulty is experienced about the manipulations.

Given a negative which is to furnish a lantern slide, and a packet of lantern plates, the question arises as to the most suitable light for the printing. Where it is available, incandescent gas does very well, and if this is fitted to the dark-room lantern we may adopt a measured and marked position for the printing frame, and make the exposure by opening the lantern for the required time. For black-tone lantern plates exposures are short enough to be made by the light of a candle, and this will be found to form a very regular and uniform light for exposing, provided after lighting the candle sufficient time is given to allow it to burn up properly, and provided also it is not in a draught and does not need snuffing.

A point in this connection which does not seem always to receive the attention it requires is that of the distance of the frame from the light. It is very important that this should not merely be guessed. The position should be kept constant, or the exposures will not be properly comparable. The slower lantern plates used for warm colors, when they are being given the prolonged exposure which is necessary to yield such colors, are conveniently exposed by means of measured lengths of magnesium ribbon, if gas or electric light is not available.

The first exposure should not be all over alike, but should be made of different lengths of time, by covering the frame with a card from time to time. In this way one plate can be made to give sufficient indication of the exposure, based on the information given in the makers' instructions, for the second plate to be exposed correctly straight away.

II. Lantern Slide Making in the Camera

When the image on the lantern slide is to be of a different size from that on the original negative, we can no longer make the slide by contact, but must do it in the camera. This is often called slide making "by reduction," because it is generally employed to reduce the size of the image on to the slide: but it is not necessarily reduction. There are occasions when the slide image will be the larger of the two, and some slide makers use this method when the two images are to be of the same size. As already mentioned, the view is held by some that slide making in the camera gives the better result; but the writer does not believe that there need be any appreciable difference, and would only use the camera method when there has to be a difference in size.

Lantern slides are made in the camera by rephotographing the original negative upon a lantern plate. The result, being a negative of a negative, is a positive, which is what we require the slide to be. The photography can be done on an ordinary plate such as is used for other work, say for snapshotting; but it is better to use a lantern plate, as with ordinary plates we cannot exercise much control over the color of the image, the picture will not be so clean and bright as the lantern plate will give, and the image will have a granularity which will be seen when it is enlarged upon the screen, although it is not noticeable in ordinary negatives which are not magnified.

There are special reducing cameras made for slide making purposes, but any ordinary camera will do for the work, provided it will take a lantern size plate. As this is the same width as a quarter-plate, namely $3\frac{1}{4}$ inches, a quarter-plate dark slide can be made to do what is required, by blocking up $\frac{1}{2}$ inch of its length at each end. Or, if preferred, lantern plates of quarter-plate size could be used and cut down after the slide was made; or a special dark slide could be obtained to take the lantern plate. This could be done also in the case of a $3\frac{1}{2} \times 2\frac{1}{2}$ camera, as although the lantern plate is $3\frac{1}{4} \times 3\frac{1}{4}$,

the image on the slide is seldom, if ever, likely to be wanted larger than $3 \times 2\frac{1}{2}$, which the $3\frac{1}{2} \times 2\frac{1}{2}$ camera would give well enough.

When a camera is to be used for this work, we must provide some means of holding the negative that is to be reduced, and illuminating it from behind. Where there are a good many lanter slides to be made, a copying board is easily constructed, and simplifies the work. This is merely a long board with an arrangement at one end to hold the negative, and at the other hold the camera. The negative holder may be a fixture; but the camera should be adjustable, so that it can be slid to and from the negative, in order to get any desired difference of scale. This can be done by cutting a long slot in the board, and putting the tripod screw, provided with a washer, through this into the camera. A fillet nailed along one edge of the board so that the side of the camera slides against it ensures the camera being square with the negative. The whole arrangement when clamped on a board in this way can be tilted up so that there is nothing behind the negative but clear sky, and the exposure made by daylight. is a great advantage when using slow lantern plates and giving very long exposures in order to get warm tones as otherwise the exposures required may be lengthy.

It is not necessary to enclose the space between the negative and the lens of the camera so as to be perfectly light tight: but it should be covered in as much as possible, in order to get brilliancy in the slides. In any case there should be no light directly in front of the camera lens, except that which comes through the negative. secure this, at right angles to the copy board is fixed another board with an opening in it about $\frac{1}{8}$ inch less, each way, than the negative. This opening must be so placed that its center is in a line with the center of the copy board, and is the same height above the board as the center of the lens of the camera. This vertical board should be enclosed, at any rate partially, by cardboard sides and top extending from it for several

inches toward the camera. All of the board and of the cardboard enclosure that is visible from the lens should be painted over with dead-black varnish. When the apparatus is fixed up for exposure, the negative is fastened in some manner against the opening provided for it, and a piece of wood being laid along, between the top of the camera and the top of the negative holder, a cloth may be thrown over it, so that the space between the negative and the lens is well enclosed, if not actually light tight.

It is important to get a powerful, even illumination behind the negative, and for this purpose there is nothing to beat daylight. The only drawbacks to it are that it is fluctuating in strength, and so must be measured from time to time with some form of actinometer, if we are to be certain of exposures, and is not available in the winter evenings when most of the slide making by amateurs is done. Some substitute for it may therefore be necessary. One method is to use the copy board or some similar arrangement, but putting behind the negative and at some little distance from it, say, 3 or 4 inches, a sheet of ground glass; 1 or 2 inches behind this magnesium ribbon can be burned, taking care to keep the ribbon moving all the time, so as to even up the illumination as much as possible. Or instead of the ground glass, a sheet of white cardboard may be set up at an angle of 45 degrees with the negative, and the ribbon burned so as to illuminate the card without being able shine directly on the negative. Incandescent gas or electric light can be used in the same way.

The trouble about most work of this sort by artificial light is that for warmtoned slides, at any rate, the exposures required may be very prolonged. A good deal is done to reduce the time, if the camera is fitted with an anastigmat lens, which, for work of this character, if the focusing is done with due care, need not be stopped down beyond f/8. For a rapid rectilinear we may have to use f/16, which means an exposure four times as long, but this is not

prohibitive.

It will be obvious that it is very important to do the focussing most carefully, so that as large a stop as is possible can be used on this account.

A magazine camera with a fixed focus lens provided with a portrait attachment can be used quite successfully for slide making, but does not allow more than 1 degree of reduction. What that is in any particular case is best found by actual trial, and when found noted. The negative to be reduced can then be set up at a measured distance from the camera, with the certainty that the

image will be quite sharp.

A good method of illuminating the negative when electric light can be had, is to fix up the negative against a hole in a large sheet of card. Some 6 or 8 inches behind the negative a second sheet of card parallel with the first is placed. The faces of the cards which are turned toward each other should be covered with white blotting paper, as this is very reflective and gives an even lighting. Then between the two cards may be placed, one on each side of a negative, a 32 c.p. metal filament lamp, so arranged that while the blotting paper is well illuminated the negative itself is screened from any direct light.

A more even and powerful light still can be got by using four lamps, one on each side of the negative: but two placed one at each narrow end, will be found quite sufficient for the purpose.

illumination Difficulties of removed if an enlarging lantern can be used: as with a condenser this gives all the light that can be required. negative is put into the enlarger in the usual way, the image being projected on to a lantern plate instead of on to a piece of bromide paper. To get a picture smaller instead of larger, the enlarger front must extend a good deal further than it is ever required to do for enlarging; but some of the best patterns of enlarger are provided with sufficient extension on purpose to allow them to be used in this way. Exposures with such an arrangement are very short indeed.

A very simple and convenient method of making lantern slides by reduction is to use a fixed focus apparatus on the lines of the fixed focus enlarger. The writer has constructed such an apparatus which takes quarter-plate negatives and reduces the $4\frac{1}{4}$ -inch length to $3\frac{1}{8}$ inches, which allows the whole picture on the quarter-plate to be included on the slide. The negative holder is that which is also used on a quarter-plate enlarger, the two apparatus not being required at the same time. The body of the enlarger is of cardboard and has parallel sides, not tapering as is usual in enlargers. The lantern plate fits in a frame at the lower end of the box, being held in position in a light-tight manner by means of a board with a crossbar turning on a pin, in the same manner as the back of a child's drawing slate. The lens used in this case was a single achromatic one of $4\frac{3}{4}$ -inch focus, which in an unmounted condition cost three shillings. It is provided with a stop about $\frac{1}{8}$ inch in diameter.

The complete apparatus was made in a couple of evenings: the most lengthy part of the operation being to find the exact positions for negative holder, lens, and plate holder respectively: which can only be done by trial. Instead of focussing the negative on a piece of ground glass placed where the lantern plate was to come, it was found satisfactory to put a lantern plate in that end, blackening it over and making a few clear scratches on the black, and then to adjust the separation until a clear

image of the scratches was formed on a piece of ground glass placed where the negative would subsequently be put. The lens board was fixed in position first, and then the end taking the lantern plate, the final adjustment being made by shortening the box until the frame holding the negative was in that position which gave the sharpest definition.

Daylight is used with this reducing apparatus, the box being set on end with the negative rurned toward the uninterrupted sky. Exposures with it on slow lantern plates for warm tones range from about two minutes upward, according to the character of the negative and the strength of the light. In order to systematize exposure and avoid waste of plates, the strength of the light falling on the negative is first ascertained by trial with the Watkins meter, and is noted. A record of the meter readings and of the exposures is kept, and in this way it soon became an easy matter to determine what exposure to give. Except that there is no convenience for altering the degree of reduction, this is a most handy piece of apparatus, and makes slide making as simple and very nearly as quick as when the work is being done by contact.

After exposure of the lantern plate, either by contact or in the camera, the operations are the same, and will form the subject of the next article.—*Photography*.

THE BACKGROUND AND DRAPERIES

By FELIX RAYMER

UCH has been said and written in the past few years about the reduction of the intensity of light as it falls on the white draperies of our lady sitters. There is no question but that we do get better results where the light is so controlled that we can get the detail in the very whitest parts of the clothing. It is often noticed in pictures

that the whites are so intense that nothing can be seen in them, and all there is in those parts is the clear white paper, attracting all attention to that part by reason of its whiteness. This is all wrong. In portrait work no part of the picture should attract more attention than the face. We are making pictures of people that are to be likenesses,

pictures that will show them so that all of their friends will know them at once. To do this and at the same time preserve artistic quality, we must have some parts that are of more importance than other parts. It then follows that the parts that are of more importance than the other parts must be so lighted that the light will fall on them more strongly than it does on the lesser parts. To arrange the light in this wise has been the effort of the operator for many years.

But there is one factor that enters into the making of negatives of artistic merit that has not been given due consideration, and yet it has a bearing on all subjects posed under the light. It is the choice of the background. Many years ago it was the custom to have the ground attract as much attention as the subject. and this was done by having all kinds of "banjo work" painted in it. Such a thing as selecting a ground for the particular effect of light we were expecting to make was not thought of. Neither did we think of using judgment in the selection of the ground for the particular subject, and the drapery the subject was dressed in. This was too far advanced for us at that time. Even now there are few that consider the draperies in the choice of the ground, and yet they are of much importance. If often happens that the reception-room clerk will ask the customer what ground he or she would prefer, leaving the choice of this important matter to one who has no idea of such things, and the operator may never have seen the costume to be worn, and may not even know whether the subject is a blonde or a brunette, and of course has had no voice in the selection of the ground. The subject is often influenced in the selection of the ground by the number of lines in it. The more there are and the sharper they are defined the better pleased the sitter often But the operator knows there is much to be gained by proper selection.

It is the custom in nearly all studios, where the operator understands the use of light and shade, for him to have some means of controlling the light as it falls on the subject's dress, if it is a white one, so that the intensity decreases as it goes to the lower parts of the pic-

ture. This is done so as to centralize the attention more at the face and to hold up to the attention the upper portion of the picture, allowing the lower parts to fall into place in their proper weight. This control of the light is done in the operating-room, by the use of screens, or often it is done in the dark-room by local reduction. It matters not where it is done, so long as the object is attained.

There are many cases when there should be no reduction of the draperies. for the ground used will necessitate the draperies being much higher in tonal value than would be the case if some other ground had been employed. If the selection of a ground is left to me, I will rule out all else except plain white and black. Not that I advocate the idea of having absolute white nor absolute black in a picture. I think it was Sir Ioshua Reynolds who said "there is never a time when there should be absolute white in a canvas, eight feet square, larger than a pea, and neither should there be absolute black, any larger than a pea." If this is true of a canvas of eight feet, I would like to know how large the white or black should be on a picture say eight inches square. But while I do not advocate the use of absolute white or black, I do advocate the use of absolute white or black grounds, not that I expect to make them come up in black or white, for it is well known that we can often get many tones from the same ground by the manner of placing it under the light. If the ground is black, and we want a slightly lighter tone, it can easily be secured by facing it farther to the light; or, if such a thing is wanted, we can make it absolutely black, by having it facing away from the light in such a way that all of the light is off of it. So it is with the white ground. It will be perfectly white if it is facing the light, but if it is facing away from the light, it will be many tones below white. So I say all tones of work can be had by using only the white and black grounds, and the work will harmonize better than if middle tints are employed.

Next comes up the question as to what we would use the white grounds for, or what would we use the black grounds for. It has been my custom to use the white grounds for the white draperies and the black grounds for the dark draperies. Now I know I have said something that many will rise up and question. It has been a belief for I don't know how long, that a dark dress or coat will not look well in front of a black ground. That the qualities will be buried in the ground. This is not so to the extent of spoiling the effect, but rather the reverse. If the greater portion of your subject is dark, that is, the drapery is dark, and we will say the hair is dark, and we were to use a light ground, it would be but undoing all of our efforts in the arrangement of the light and shade, in soft effects. There would be a sharp, clear-cut outline that would show all of the little irregularities of the outline, for the reason that it would be clear-cut against a white field. This, we know, is not the proper idea of concentration and subordination. If we are to have a balanced lighting, as far as light and shade are concerned, we will have to look to all things, the little as well as the large, and the background plays no small part in the arrangement and placement of lights and shades. We should have our work divided into two classes, the low class, or low tone we will call it, and the high tone. Now to the low tone belong the dark draperies and brunettes, and to the high tones belong the white draperies and the blondes. If the subject is dressed in black, and is a brunette, he or she belongs to the class known as the low tone, and all else must be arranged to harmonize in that tone. If we introduce in that picture some feature that belongs to the high tone we will be working at "sevens and sixes" and a lack of harmony will result. There is no time when there should be two forces in a picture that have the appearance of pulling against each other. Let everything trend in one direction, and that direction is harmony. So if we have such a subject, our ground should be dark to harmonize with the subject. And it will be found, if tried, that it is an absolute impossibility for one to get the black dress and the black ground so near together that they will blend perfectly, and still have detail in the shadows of the pic-

It is well known that there is no ture. when we should have absolute black time r pictures (I recall again Sir Joshua in ou.olds' words).

Reynw if we have a subject dressed in No draperies, and she is a blonde, it is whitean to use a white ground. Not that my pke it perfectly white in the finished I mare, for I do not want that, but I picturrange it so that it will harmonize can the dress better than I could if it with a black ground. Again, some may were it will give the picture too much think sameness, with no definite outline. of a is wrong, as there will be all the This ie that there should be. If we have outlira subject, and were to use a black such id, without the customary screengroupefore spoken of, we would have ing h outlines, and in addition to that sharp-ould have strong halation around we wgure against the black ground. But the fi white ground is used, there will be if theittle, if any, need of holding back but Iraperies with the screens.

the dw, next comes up the question, No I not make pictures of a subject "Caned in white and still use a black dress(d?" Certainly one can; but it is grouns as in all things where a change in thiessary from a natural course to one is necn to nature. It takes a man that foreig stands nature thoroughly to comunderature. It is nothing but nature for bat nte ground to harmonize better with a white subject than it does with a dark a whi It is also natural for a black ground one. rmonize better with the dark subto hahan it will with the light or white ject t If we are to change these condione. we must have a thorough knowtions of the whys and wherefores of this ledge ony.

harmas been my experience, that if we It lpt lighting a sitter that is clothed attemite, and is a blonde, against a dark in whick ground, the draperies will have or blaskilfully handled to keep them from to be g away from the dark-room man gettin ver-developing so far that all deand o lost in the whites. This is, of tail is, done by the judicious use of courses, or local reduction, as menscreen before. But as soon as we do tionede are but trying to make harmony this w harmony does not exist. To do where

it we have to tone down the figure to harmonize with the black ground. Here we are pulling the whites down to the blacks, where by the use of a white ground we would have been pulling the whole scheme of light and shade up to a higher key, and thus have secured the harmony.

PHOTOGRAPHING OLD PEOPLE

F course it is axiomatic that the first office of a picture (a portrait) is to be a likeness, and however much this self-evident truth has been lost sight of in these later years, since the desolation of retouching has darkened the land, and photographers have lent their efforts to catering to the vanity of females of both sexes, the cardinal reason for making portraits at all remains

as in the beginning.

All persons, of whatever age or condition, are interesting (if they are clean) to one who has a talent for likeness making, but to me old people have a peculiar interest as subjects. Babies and very young children afford a kind of whimsical grotesqueness in their efforts to get the hang of life; the young man and woman in their gathering strength and charm furnish fine studies; the middle aged, who have developed all their powers, and are in the midst of the battle of life, call for serious and thoughtful work; but the old, who are emerging from the thick of the fray, bearing upon their faces and in their air a record of the experiences that have come to them, set against a background of racial lineaments, form a class at once distinctive and unique, and are perhaps the most difficult to manage. In the first place, the old person often feels that the fact that he is old demands an apology, or at least an explanation, to account for the folly he commits in having a picture made. He seems to feel that there is no beauty but the beauty of youth, and that the furrows of his cheek and the wrinkles of his brow are something for his younger family friends to be ashamed of. Hence it is very difficult, if you would please your sitter, to exercise that temperance in retouching

that a successful portrait calls for. I remember an old lady who came to me and placed quite an order. She impressed me as a most beautiful old lady; her hair was still abundant and evenly turned to white, her face was a perfect network of soft lines (you could hardly call them wrinkles), and her expression was one of great refinement and sweetness. I secured one negative that I thought was ideal, and her pictures were made from it. retouched little, if any; it was so soft and delicate that a retoucher's work would seem like a bull in a china shop. Some time after I saw her and found that her photographs were but indif-ferently satisfactory. She told me that she had a sister whose face bore more of the marks of age than her own, and that her pictures (by another photographer) did not show a trace of them. There you are with the average old person, especially if it is a woman; but there is a compensation in the fact that a good, faithful likeness is sure to please the friends of the sitter, and, moreover, a sense of duty performed in sending down to their posterity a true portrait of their relative in his or her old age. Such pictures are very interesting to the family in later years. But there are some things to be observed if we are to secure a good portrait. In the first place, they should never be disposed of hurriedly. They come a little sensitive about their old faces, and somewhat geared up at the thought of sitting. Take time to have some conversation with them, and establish, if possible, a feeling of familiarity and sympathy; make them feel that you are interested to get something that is really good, and that it is not wholly a matter of business with you. Characteristic attitudes count for much more in the way of likeness than with younger people, and for that reason it seems to me that a half-length or full figure is better than a bust in many cases. Then comes the question of accessories, which



BY THE BENJAMIN STUDIO

should be something not out of line with the apparent condition in life of the sitter. Sumptuous furniture and stately interiors are a mockery and an absurdity when your subject is a plainly dressed old person of the humbler class. A chair that suggests the comfort that

old age requires often adds much, but, what is better still, is the chair they are accustomed to sit in at home. I have sometimes been asked if their home chair might not be sent in for the purpose, and the idea is a good one. The nearer we can get to chimney-corner effects, the better. For that reason, sittings made at their homes, where some familiar objects can be included, are of especial value. True, we may not be able to achieve as fine effects in lighting, or find our accessories to give the balance of light and shade we desire or to please us entirely in the matter of composition, but the home sentiment will outweigh them all. In not many cases, perhaps, will these home sittings be had, for various reasons, particularly the increased expense, and we must fall back upon such things as we have under our skylight. When we find that we have nothing that accords with the personality of the sitter, it is better to employ a perfectly plain ground that will give proper relief to the subject, and, at all events, not detract from the likeness by dragging in elements that are foreign.

I am convinced, too, as I have explained before, that in the case of old persons, a prolonged exposure is better than a short one, for the reason that the tense muscles with which the sitting commenced will relax, and several expressions, perhaps, will flit over the face before its close, the blending of which will almost always secure a better expression than a short exposure.

Give your customers a courteous invitation, an attractive show-case, a homely studio, and good value, and they will come again.

About the time you begin to see something interesting out of a car window, the train runs past two miles of box cars on a siding.

New ideas make big successes. The man who can anticipate new wants or create some new demand wins fortune. Autochrome Exposure By this time most of us have noticed the disproportionate loss of sensitiveness of autochromes to feeble light. Exposures both indoor and out should be at least doubled during the winter months, and even trebling them will probably only give a slight overexposure, which can be put right by intensifying. Underexposure is far more likely to happen than the reverse in weak light, and if it occurs it is more intractable.



BY J. A. BELL THE BENJAMIN STUDIO



MASTERS IN PORTRAITURE—HANS HOLBEIN

EVERYBODY who has seen the collection of Holbein drawings at Windsor Castle will agree, whatever else the opinion may be, that there was a man who could show character. All the line work is so precise and clear and yet so picturesque in effect and the facial expression so lifelike and convincing that one pauses in sheer wonder at the wizardlike dexterity of

this medieval painter.

Of course, the Windsor Castle drawings are drawings, or, to apply a perhaps more appropriate term, sketches. This explains to a certain extent their unusual virility. Sketches always convey the spirit of spontaneity more readily than finished paintings. But Holbein succeeded in preserving the placid touch of his sketchy treatment in his most elaborate portrait compositions, and this is the more astonishing, as most of his portraits are what a modern artist would call "highly finished." There is no shirking of detail, no blurring of effect; every phase of facial construction is noted down with almost scrupulous care.

The illustrations accompanying this article are all reproductions from wellknown portraits scattered throughout tbe galleries of Europe. They all have beauty of drawing in common. Can anything more perfect, as far as pure line work is concerned, be imagined than the otherwise so unsympathetic face of Henry VIII? The artist makes us like and accept the picture as a superior production by force of his technic. And in Holbein's art it means the contrast of line and flat planes. Nearly all his portraits are constructed in that manner. They are often nothing more than colored drawings, but he had the true eye for painter-like effects. He could produce depth and tone by a few large, dark, and well-placed planes. He concentrated all the light—and even light that did not throw deep shadows —upon the features, treated the bust in as simple and shadowy manner as possible, and silhouetted the shape of the head and shoulders and arms clearly against a middle-tint background.

He apparently liked three-quarter views best, as the three-quarter view affords finer opportunities for the display of skill in drawing than any other. Figs. 1, 2, 4, 5, and 12 carry out this principle most convincingly. They show the bust as well as the face in three-quarter. For younger men and women he sometimes favored the full-face view, as shown in Figs. 3, 8, and 10. In these compositions he also favored the three-quarter view of the bust (viz., Figs. 3 and 10). In his three-quarter face views he sometimes favored the full-front bust view, as seen in Figs. 6 and 11. Profiles he used only sparingly.

Holbein always applied the simplest, most fundamental principles of composition in his portraiture, and it is a matter that could be well recommended to all later-day portraitists. Queer and novel space and tonal arrangements, no doubt, have their place and please us by their variety, but they never convince, as the simpler

forms invariably do.

Holbein's aim was to give us the human face, and he did it without subterfuge. Look at the bulky nose of the old man (Fig. 6). What modern portrait painter would dare to present it in such a straight-forward, matterof-fact, almost brutal fashion? Holbein subdued the shapeless organ by extraordinary draughtsmanship. He studied it, no doubt, with a vague smile on his lips and a twinkle in his eye. It interested him, and he drew it simply as he saw it. And it was his interest in all manifestations of form that saved the situation. By being interested he rendered the depicted object interesting. His truthfulness of delineation is astonishing; no line or plane in the facial expression of a human being escaped his notice, and he reproduced every observation with a fidelity that is as rare as it is fascinating.

The portrait of Erasmus (Fig. 12) was one of his first portraits. He painted it at the age of twenty-eight, and in a way it established his fame. Through this portrait—still a trifle



1. SIR RICHARD SOUTHWELL
2. PORTRAIT OF A YOUNG MAN

3. PORTRAIT OF A MAN
4. LADY BUTTS

hard and awkward—he made the acquaintance of Sir Thomas More, who introduced the young German painter at the English court, and ever after Holbein was intrusted with important portrait commissions, both for the king and the principal personages of the kingdom. Holbein's portraits are one of the best commentaries of that particular period of history. The king and his unhappy wives and all the notables of his personal entourage have come down to us in his canvases like living human beings.

From the view-point of composition the totality of effect in Holbein's

portraits is particularly interesting. Everything is subordinated to the facial expression, a typical, as it were, composite character delineation, and this was, and is to this very day, the highest aim of portraiture. Worthy of special consideration are also a few minor peculiarities of treatment that occur again and again on his canvases. One of them is the introduction of lettering in the background (viz., Figs. 1 to 4). It would look awkward in most pictures, but does not seem to furnish any disturbing element in his canvases. This is due to the symmetry and severity of his form



5. HENRY VIII
6. PORTRAIT OF AN OLD MAN

7. DR. JOHN CHAMBERS 8. LADY VAUX

arrangement. The lettering is frequently large, though never conspicuous. On the contrary, it lends a slight decorative note, an animation to the background in the otherwise so calm and at times almost austere composition.

Holbein apparently overcame all difficulties by directness of representation. Fig. 4, the portrait of Lady Butts, is a good proof of this statement. The angular lines of the headgear would have exasperated a modern portraitist. The medieval painter, not abashed the slightest, cheerfully utilized the angles and white lines as a sort of geometrical pattern. The unwieldy forms were there; they were characteristic of the period in which he lived; they reflected the portrait, and, in a way, the customs and manners of the people. What was the use of idealizing or ignoring them? So he simply made the best of existing conditions—at all times a wise thing to do.



9. SIMON GENGE FROM CORNWALL
10. DERICH BORN

11. THE ARTIST'S WIFE AND CHILDREN 12. ERASMUS

The same holds good of Fig. 9. Who would today represent a bearded man with a carnation in his hand? The artist would be afraid of being criticized. It might look silly. But is there really anything unpleasant, foolish, or over-sentimental about it? If a thing is well done the feat of performance condones for all incongruities.

The group of the artist's wife and children is perhaps one of Holbein's most ambitious efforts. The figures look detached, but the heads are well placed and the lighter planes offer

perfect balance to the rest of the picture. In the mother's careworn face (she led a rather unhappy life of prolonged separation from her husband) we notice the same truthfulness of expression. We see a distinct character before us. And to anybody acquainted with the painter's biography it will represent a chapter in itself, a chapter filled with devotion and sorrow and maternal love. Portraiture that can convey such an impression is great portraiture, and Holbein frequently was one of its most illustrious exponents.

POSING, LIGHTING, AND ARRANGEMENT OF PORTRAITS

Part II

By F. C. TILNEY

Gentle Force

The effect that wears best is that of a gentle force in figure and setting both: the old conventional thing, in fact, done well and tastily. A danger to be avoided is a general partial lighting which brings out a sprinkling of light and shades everywhere. If this occurs some re-arrangement must be made by which darks will be swept together and the lights also.

Backgrounds

This brings us to the consideration of backgrounds, and their part in the complete effect. I shall not here go very exhaustively into the matter of backgrounds. I have spoken of the modulated variety of the plain background as the most serviceable. With such a background the use of accessories in anything short of a full-length is obviated. Whether this modulation is the result of shading by blinds, or whether it is painted on the 8 x 8 cloth, does not matter much so long as it is there in some form or other. A portrait that is backed by nothing at all is bald to ugliness—it has no harmony of parts. The great essential is that the lights and darks of the backgrounds should come at the proper points against those of the figure. The principle formulated by Da Vinci four hundred years ago has always held, and does today. It is that the darker side of the figure should touch upon the lighter side of the background, and vice versa. The contrast thus set up need be no more than sufficient to emphasize the important parts, which are usually in the head. The example on the screen carries out the idea very well, except for the blaze of light over the shoulder, which discounts the force in the head. There is another tradition of painting

which would have cured that defect, but it does not yet seem to have found its way into photography. It is to allow a darker tone on the background that may pass for the shadow of the sitter. It occurs not directly against the sitter, but at the other side of the light patch of the background. The picture before you is a moderately successful example of it. Too much attention cannot be paid to the adjustment of the background, which, indeed, is the thing that lifts a mere figurestudy up to the level of a picture. Its dark and light passages should be used for massing with those of the figure, as already described, for the betterment of the composition and to secure simplicity and strength of effect.

Horizon

With regards to the horizon, perhaps it is unnecessary for me to remind you that it is actually always at the level of one's eye. If we go up a high mountain, it comes up with us, and naturally allows for a lot of the earth spread out down to our feet. If we wade into the sea so that the water is up to our eyes, the horizon is down there, too, and the earth and sea are foreshortened into a mere line.

Its Relation to the Figure

It is a fact that things above the eye look bigger and more imposing than things below. It is also a fact that to look down on things does not make us feel respectful toward them, while to look up at them reminds us of our own lowness. This is optics and moral philosophy all at once, and so you should regard the matter. In the old days, when decorative wall-painting was much practised, it was usual to place the horizon actually at the feet

of the figures, because of their gain in dignity. In like manner, to avoid the loss of dignity in their portraits, painters have at all times used a platform about eighteen inches high, called a "throne," upon which the sitter was placed. This secured the foreshortening of the lap. I do not remember to have seen such a thing in a camera studio; but I affirm that if the sitter is to be seated, either an elevated seat or a very low camera is required for the best results.

Relation to Type of Sitter

Especially is this so if the portrait is more or less one of state, such as an official in robes or a lady in full dress or in character. It is not, perhaps, so necessary if the pose is a domestic one, or one where a writing-table is employed, because in such a case the mind makes due allowance for looking a little down on the sitter, since that is the way the figure would be seen when so engaged. But it is better to err on the other side, for nothing looks more ignoble than a bird's eye view of a person's scalp, shoulders, and lap; and a fine pose under such conditions is impossible. With children the case is different. They are so often near the floor that we do not regard that view of them as undignified. Even then the camera should not be too close. In all cases more grace and better proportion results from the more distant stand-point.

Relation to the Design

Of course, it is absolutely essential that the horizon, if it is simulated in the painted background, should agree with the actual one fixed by the camera. Unfortunately, this is a common source of error. If the horizon is represented upon a painted background, care must be taken that the lens is level with it. Figures will then look right whether they are on the floor or up on steps, banks, or terraces. Close up the foreground as much as possible by a low camera, not pointed downward, and keep the latter as far away as may be. Those are two golden rules for dignified posing.

Expression

Having arranged the pose, the lighting, the background, and the design, we have yet another responsibility and that is the expression of the sitter. It will be admitted that a person's characteristics are looked for more in his facial expression than in his pose. Therefore it is a most important matter. In photography it is even more difficult than in painting. We may be charmed with the eloquence of a sitter's face while the preliminary conversation is going on, only to find it replaced with a stony mask when the business begins. You probably all know better than I can tell you what dodges to adopt in order to keep the expression alive.

Animation

Painters talk to their sitters. Perhaps photographers could squeeze the bulb immediately after the sitter has finished a sentence and before the vital force which prompted the remark has had time to evaporate. A sharp "Excuse me" driven right into the middle of a remark might instantaneously hold him up while the shutter is opened.

Contemplativeness

The contemplative person should give no trouble. His habit is to sit without moving. Such a person can be posed at leisure, and then asked to take no notice of anything, but to think about the thing that gives him most concern in life. A sitter possessed of a face of great character need not even be asked to look pleasant or interested; he will do best as he is.

Dignity

There is, further, a style of face that is in no need of expression at all, and that is the handsome face. In fact, such faces are, as a rule, vacuous. All the portraits of Mrs. Langtry, who was in her heyday the nearest approach to the classic ideal of any professional beauty, show her to be devoid of any claims to expression. The best period of Greek sculpture is, indeed, without

facial expression: Character implies a departure from the normal: mere beauty must necessarily be the exact normal of an accepted canon or type. With such a sitter little trouble can arise, and silence and serenity will create the best atmosphere. My own experience has taught me that, as a rule, a beautiful model "goes all to pieces" the moment a remark or a ripple of thought disturbs the mask-like placidity, and it demands severe silence to keep her sculpturesque. Usually handsome people of either sex have considerable dignity of expression and sometimes a touch of haughtiness gives a spice to the dignity. If such a feeling of superiority is detected in the sitter, it may not be amiss to flatter it by such a remark as: "I suppose you must be very tired of being photographed, but naturally there must be a great demand for copies.' A smile with a haughty touch will certainly appear if it is a woman.

Charm

But some beauties have charm, and charm calls for more animation, which may be evoked by nicely chosen, deferential, but not too distant small-talk the very slightest degree personal. If possible, let the eyes look to the lens, even if the head should be turned a little away. This is a thing that is not at all required with the coldly handsome lady.

Fitness of Expression to Subject

All these wiles every good photographer knows. Obviously, it is not wise to adopt an invariable method of approach to every sitter. The ideal way, though it is not always practic-

able, is to get to know the sitter a little first, and when that is done it is impossible that such a mistake would be made as to cause the haughty beauty to be jocular or the pensive poet to grin. A suitable expression covers a multitude of sins in other directions, and it is, therefore, of the utmost importance that the fitting expression is seized upon when it makes its appearance. The "smile, please" idea is, I hope, forever exploded, for who but a musical-comedy girl, rich in teeth, can smile to order?

Groups

With regard to groups, it would appear that the greatest difficulty lies in the direction of a proper unity of interest. It is not at all easy with two or three figures having equal claims to prominence to combine them satisfactorily in one picture. To suppress one of them by any available means would be fatal to the photographer's interests. He has to put them all practically on one plane, and to give each something like a fair share of lighting.

The surest way to secure a proper unity of purpose in the sitters is to see that every member of the group is actuated by a common interest. It is very unwise to let the individuals look in different directions, for this appears to divorce their interests. Neither is it advisable to let them all look into the camera, for that suggests the school-treat group. In pictures of mothers and little ones it is usual to turn the heads toward each other, which is certainly better than letting both stick bolt upright.



PHOTOGRAPHERS, DO YOUR BIT!

SOME months ago the Photographic Division of the Signal Corps of our War Department sent out circulars to amateur and professional photographers requesting them to enlist their lenses in the army, and offering them an opportunity of helping to save the lives of their brothers at the front while they were permitted to remain at home and continue at their peaceful calling.

Just how many responded is not to be told. We hope that at most 10 per cent. of such lenses as are required are in the hands of civilians. And we trust that the government, having offered to pay the seller's price, may not be compelled to condemn and appropriate what it needs. *The call is urgent*. Every call at this time is urgent.

For some time pictorialists have been shelving their high-grade anastigmats, and have taken to single achromatics, diffused focus, rapid rectlinears and even pinholes. These glasses are virtually idle and should be put in service immediately.

We have been asked what the Government will give. One man said he heard he could get list price. The Government invites you to name the price and submit the lens. Risking an opinion, we should say that the fellow who asks list price should be given it and immediately drafted, so that he may fully

realize just how the lenses are used to protect soldiers' lives. His contempt for gougers will extend to himself. No one has asked what a fair demand might be, but speaking offhand we should say a dollar and a patriotic letter offering to help get more lenses. A more frugal demand were to find the cost of an American lens, and ask 50 per cent. of that. When one deducts the use one has had from the old, and allows a percentage as a contribution to the cause of one's country, a figure fair to all parties is arrived at. Be it understood that the War Department does not make these suggestions or ask any sacrifices. The circular printed in our News department says it all.

Look over your old pictures of scenes and people. Consider the freedom with which you have been permitted to expose your plates and films. There has been no tax upon you. Just now we are all paying a share of the cost of maintaining that freedom; but what will your share be if you should have to pay a share of the entire cost of the war to a nation that, as our conqueror, should dictate the price? What would your conscience say if some occasional regret came to you that your lens might have helped to a better fate! Millions are giving their lives. You may say, you are prepared to give your life for the defence of your country. Fine! Just keep your life awhile and enjoy it. Only give your lens.

WHAT'S THE MATTER?

What is the matter with the average photographer these days? He doesn't seem to be making any headway. His place looks just about the same as always. He constantly complains that business is poor or only fair. What's the matter?"

Our answer is: He's in a rut! The barnacles of indifference, or lack of up-to-date methods and practices are

keeping him down.

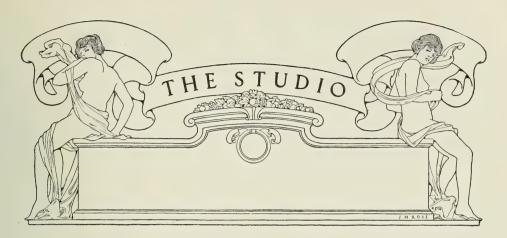
If you wonder what is the matter in your own individual case, when you seem to have no power of yourself to help yourself, just stop and look about. And if you have a spark of ambition and want to be progressive, up-to-date, and successful, Make a change, and start right now! Change your methods. Change the appearance and arrangement of your studio. Change your equipment. All this does not mean, necessarily, added expense. But it does mean new applications and new methods. Ask yourself: Am I using the latest and best I can give? Am I getting the best results possible? Is my studio bright and inviting? What efforts am I making to get new business?

Now if there is one good thing this mighty war is sure to do, it will throw you—yes, force you and others—out of the old ruts. Is it not high time to do some careful thinking and land right?

We are today witnessing the most extraordinary adjustments of business to the demands of war. Out of this maryellous laboratory will come new

methods, new discoveries, new applications. While we are not going to be made over, we shall have a new revelation and grasp on higher and better realities. We will be taken completely out of the old ruts-old conditions and ways. Every industry and profession in this country of ours is going to feel vitally these far-reaching consequences. There is sure to come an evolution in photography. The Journal has already alluded to the efficient organization in the photographic corps at Washington. Hundreds of the ablest men in the photographic field are giving the Government the benefit of their knowledge and experience. New and efficient methods are being developed and adopted which later will open the eyes of the profession. The old order is changing. Do you want to keep abreast of the times forge ahead? Observe and learn what and how the other fellows—more progressive than yourself—are doing. Strive to make your work more distinctive and individual, by new printing methods, papers and mounts, by new system in your studio. THE JOURNAL has an important series of practical articles on these subjects, prepared by an eminent photographer, which during the year we will present to our readers. The opportunities everywhere were never greater for the American photographer-in portrature, "at home" and in the studio and along commercial lines. It will be the progressive, wideawake, up-to-date photographer who will arrive and succeed. What's the matter? Get out of the ruts!





PRACTICAL PAPERS ON STUDIO WORK AND METHODS

Composition and Arrangement

THERE is one subject which will always furnish an interesting line of thought for either the professional or amateur photographer. It is a subject that may be treated by many writers, each giving his views with clearness and succinctness; it may be studied by the majority of readers of photographic literature; but from the examples of work seen every day, it is still necessary to urge photographers on to greater efforts in regard to composition and arrangement.

It is a mistake to think that out of the ordinary everyday family who come to the studio to be photographed an ideal picture can be made, or that twenty or thirty persons who have asso-ciated with each other for a short time, such as we find in schools and clubs, can be made to furnish material for or enter into the spirit of an ideal, artistic composition, such as the photographer may have in his mind; nor is it within the bounds of possibility for any artist to make a prize picture from such a combination of persons. The subjects for a group which has for its object the illustration of some story, poem, or whatever other romantic idea the photographer may have, must enter into the spirit of his theme, they must be trained not only in expressing the attitudes which are necessary to explain the story, but they must also give expression in their countenances to whatever thoughts the story may suggest. What would be the effect of a picture where the attitude denotes life, action, energy, everything that goes to illustrate a story of active and daring adventure, if the face could not express the feelings which we imagine should be felt by a person in such a position? It would most undoubtedly be flat, uninteresting, and absurd. I have seen in many phootographs evidence of this want of feeling and harmony of expression; while the attitude told you a story, the face belied it.

If we look at the works of celebrated artists we will see that the face and attitude express the same idea. Love, hate, fury, despair, fear, horror, illuminate, sadden, or distort the countenance and help with clearness and force to bring

the story of the picture vividly before our minds, while the attitude speaks, as it were, and gives greater effect to the whole. Take, for instance, one of Meissonier's paintings, "The Sign "The Sign Painter," in the Metropolitan Art Museum. A reviewer says: "The scene is altogether a transscript from a past generation. If we remark the expression of these men (the cavalier and sign painter), we see characteristics which reflect their inner and true personality. What amiable, self-complacency is betrayed in the satisfied air with which the sign artist awaits the cavalier's verdict upon his work, and how consummate is the cool criticism on the part of the latter. We should not know where to look for a counterfeit presentment of man that approaches to nature herself than this unimpassioned inspector of the tavern sign. He is real to the very creases in his boots and the buttons on his coat." Can the glowing description of the poet or the realistic language of the tragedian clothe a scene with more explicit meaning than the pencil of the draughtsman, the brush of the painter, or the camera of the photographer? A mere description can never equal or appeal to us as strongly as when we see it before us in a picture. The painter has a greater advantage over the photographer in being able to dispense with any objectionable detail that might destroy the beauty of his subject As a celebrated writer observes: "The details of the prose of nature he omits and only gives us the spirit and splendor. In a landscape he will give us the suggestion of a fairer creation than we know. He knows that the landscape has beauty for his eye because it expresses a thought which is to him good, and this because the same power which sees through his eyes are seen in that spectacle; and he will come to value the expression of nature not nature itself, and so exalt in his copy the features that please him. In a portrait he will inscribe the character and not the features, and must esteem the man who sits to him as himself only an imperfect picture or likeness of the aspiring original within.

The photographer must be satisfied with nature as he finds it, whether it is frowning or smiling he must be content. Therefore if the

subject is not in entire harmony with his ideas, if he does not enter into the spirit and give his thoughts entirely toward carrying out whatever story the picture is intended to illustrate, the result will be a failure. I would, then, say to the photographer: Be satisfied with representing the character of your group and refrain when you have but indifferent material from trying to adorn a moral or point a tale. It is also well to remember that a long course of study is as necessary for the photographer as it is for members of any other profession. The greatest painters, poets, and writers study the words and profit by the experience of men who lived in by-gone years. They would not, or could not, reach the highest point of perfection if they had not done so. The works of men who lived away back in the ages which we call barbarous are eagerly devoured, and the creations of their hands and brains are studied by the great men of this and other generations, and why? Simply to gather material for the foundation of works which they expect to create. There are rules and reasons for everything, and unless men train themselves to go strictly according to the rules that govern their work and find out the reasons why such rules are applied to it, they cannot accomplish much; they will be toilers in the dark, stumbling and groping to the end.

At the present time, when the works of the greatest artists are faithfully reproduced and explained, it is easy for every photographer to study them and gain very great benefits from

doing so.

The paintings and illustrations of ancient and modern times are collected and put in convenient shape by the publishers of photographic works, together with criticisms and explanations by celebrated art writers; these will be found to contain many things which are necessary for the photographer to know. Study the works of others, master their details, then give life to your own thoughts.

In the Future

There probably has never been a time when the job of the prophet was such a hazardous one as the present. There is, of course, a general conviction that ultimate victory is assured to the Entente powers, but when that victory will come or at what cost it will be attained can only be a matter for conjecture. At present photographers have as a body benefited by the enforced military activity which is in progress all over the Empire, and so long as fresh armies are being raised this wave of business is likely to continue; but that cannot go on indefinitely, and the prudent man will endeavor to establish a reserve which will enable him to meet the new conditions which will inevitably obtain after the termination of the war. There is, we fear, little prospect of materials reaching their former level of prices for many a long day, but this should not affect even a middle-class business to any great extent, and to counterbalance any loss in this direction there is undoubtedly a revival of what may be termed the sentimental aspect of portraiture. Any photographer will tell you that apart from soldiers themselves he has had many sitters whose modesty would have prevented them from visiting the studio had it not been for the urgent request of those who wished for a portrait of someone dear to them, although no amount of skill could make it a work of art. We see in this tendency an opportunity for photographers in general to cultivate what will be to many a new field of work, although the older hands have reaped many a rich harvest from it. It is perhaps too much to hope that the family album will be resuscitated, but a considerable amount of business may be created by undertaking to arrange collections of odd portraits in suitable portfolios. A very good price can be obtained for such work, and when it is in hand it is often quite easy to get orders for copies or enlargements from old pictures which the owner has not thought good enough to bring especially for the

urpose.

As it may be thought that such arrangement may be a very difficult task, we would suggest a very simple way of uniformly mounting in any size without removing from the old mounts or running any risk of damage. It is really an adaptation of the old carte album to present requirements. The size of portfolio being decided upon, a set of plain mounts to fit it are procured. These may be of various thicknesses, so as to suit the mounts they are to receive. Double the number of sheets of paper are also required; they may be any of the thinner art mounting papers. All that has now to be done is to lay each photograph upon one of the boards, and to run a pencil line round it. Then send the boards and one set of the papers to a mount cutter, with orders to cut an opening with square, not bevel, edges in the former, and an opening designed to show the best part of the print in the latter. When this has been done it remains only to sandwich the board between the two papers, with the photograph in the central cell so made. If the two papers are of the same quality and they are put on as quickly as possible one after the other, the compound card will have no tendency to warp.

Much family business is lost to local and provincial photographers by their reluctance to undertake "at home" work. Anything beyond the outdoor group is looked at askance, and even the group work is not sought for as it might be. The majority of workers fail to make the most of their opportunities when they get a footing in a house, by not suggesting pictures which the customer would never have ordered on his own initiative. It is a most excellent plan to have an adapter made for using half-plate slides with a 12 x 10 camera, as it is often possible to make a few cabinet sittings where larger work would be

declined.

There can be little doubt that after the war, as well as during its duration, people will lead quieter lives. There will be less travelling about, and with many the habit of seeking amusement away from home will be lost. All this is likely to benefit the photographer if he will only recognize the fact. But he must not expect the public to come to him. He must go to them, and, as other traders have learned to do, make them feel the absolute necessity of patronizing him. Moreover, when even the smallest order has been executed the customer must never be lost sight

of, but kept informed of every new departure or suggestion that may be made. The photographer who can make a good living by depicting beautiful ladies may not need to work so hard to get business, but he can only exist in a few great centers, and after all his position is a precarious one, unless he has great adaptability. The fashion this season, somewhat out of date the next and altogether a back number the year after, is often the history of those who cater for the society butterflies, while his more commonplace brethren have been steadily building up a business which is independent of passing styles.

One word to the aspiring young artist. Do not scorn the class of work which we have been suggesting as profitable, for as much skill and artistic perception can be exercised in photographing an old lady at home as in taking a decolleté beauty in the studio. Some of our best artists have made their names before they possessed a studio, and have done no better afterward. "Whatsoever thy hand findest to do, do it with all thy might," and do not send out "at home" work with an apology. There is no excuse for "soot and whitewash" now, and a satisfied customer is the best advertisement.— British Journal of Photography.

What to Throw Away

When business is good, that is the time to replace everything in your studio that is out of date, no matter what condition it is in at the present time. The only question for the photographer to decide is, "What to throw away." Whether he shall start in the reception-room and throw away the old pictures and frames that are on his walls, which are of the same pattern as his customers in his town threw away from ten to twenty-five years ago. The old carpet or rug on the floor; the ancient show-case; the old-fashioned chairs and other bric-a-brac. Should this be thrown away first, or should he go into his operating-room and pull out the old posing chairs, backgrounds, cameras, and stained curtains, and take them out in the back yard and burn them up? The only question which a photographer should consider at the present time is, "What to throw away first."

For some reason that no one of whom we have ever asked has been able to explain, the average photographer has an idea in his head that nothing in his studio has depreciated in value. That he can sell up-to-date photographs and make just as good a profit if he still allows pictures to remain on the walls which were made by his predecessors or someone who had the gallery many years ago. In the workroom and printing room one-half of the things there are of no value; it costs money to use them; they simply take up room.

Many photographers walk anywhere from ten to fifty miles a day in order to conduct their business, while if their studio was properly arranged they would only have to walk from one to five miles. It is the most expensive of anything that goes to make up the overhead expenses of the studio. Once in a while we hear of a photographer saying "the stock-house gets all his money." If he would just sit down and take

his cash-book and figure up for any one month the amount of cash taken in and for what it was paid, he would find that what the stockhouse receives for supplies is a very small percentage of his expenses.

Do you know that if you wanted to sell your studio today you could get more money for it if you threw away all the old trash you had in it and replaced them with just a few modern articles? As a rule, it is the up-to-date man who is looking for a new location, and the moment he sees the old stuff in the reception, operating or printing room, the value of the studio goes down immediately in his estimation. Just as soon as you read this article do not put it off for a day or hour; go through your studio, and decide immediately what you are going to throw away, and do it at once.

After you once get started it will be easy for you to work along that line until you have thrown away the old and replaced it with new, and have a real, up-to-date studio.—*Photo News*.

The Reception-room Clerk

In the Oriental countries, where the natives worship idols in that form of worship which is called Buddhism, one of the main characteristics of their creed is, "Do unto others as you would they should do to you;" and nowhere can this most excellent of rules apply better than in the everyday-work of the reception-room clerk. Let us consider the duties here found from a woman's stand-point. First, as to her personal appearance. We all know that nature does not always distribute her gifts equally as far as beauty of face and form is concerned; indeed, in some instances she seems very chary of such gifts, but even where this is the case one may still become attractive by cultivating the best qualities they possess to the extent that the unattractive ones sink into insignificance. One who is determined to attain success may here cultivate the wonderful depths of magnetic forces to great advantage. The power to draw out, the power to lead and the force to control are wonderful factors in the success of reception-room work. As to her appearance, there's nothing like the eternal fitness of things. hair should be dressed in a simple manner, and the costume conspicuous for its neatness and unobtrusiveness; evening coiffure and discarded finery could nowhere be more out of place. As to her manner, she should be bright and wideawake, most quiet and refined, for remember this is an art studio, and there is such a thing as an artistic manner.

Make Attractive Displays

As to the room or suite of rooms in which she spends her time, much may depend upon her native taste. If her employer is a man of artistic taste (and we feel bound to say that he must be if he is a successful photographer), and if he has used money enough combined with his taste in furnishing those rooms, then it is the place of the lady at the desk to see that the best care be taken of these furnishings, and that most attractive displays be made; but, on the other hand, if the rooms are bare and unattractive,

she may lead her employer through those same forces before mentioned to see that "seeming success ofttimes brings the reality" right here in the reception-room. She might lead him to see that money spent, say for a moss-green carpet, with side walls of green half-tones, with ceilings of cream and gold, a few modern, comfortable chairs, a suitable table or case for displays, a neat desk, together with pictures hung upon the walls in tastily-selected frames—pictures the best the studio could afford or produce—money spent this way is bound to return tenfold if the lady at the desk does the right thing.

Then, in the other hand, the room may be most plain and cheap, but, whatever the furnishings, it must be kept clean and fresh. This is the reception-room lady's duty, whether the janitor does it or whether it falls to her lot; to

meet success it must be done.

A Nice Entrance is Attractive

The entrance, as well as all displays, must come under her supervision also, and here, whatever the conditions, things must be clean. An entrance should be most inviting. As to displays, these, too, come under the care of reception-room girls. Much artistic taste must be used in arranging these displays, which need not, necessarily, be so large, but must be fresh and clean, as well as artistic. A display which continually attracts attention is surely all right. Many are the ways for showing pictures, and in some places inside as well as outside displays must be made under glass.

Watch for New Samples

The maker of displays must ever be on the alert for new samples. These she will most frequently find as the prints come from the finishing department to be spotted and sorted. Selecting the best, she may make her wants known to the printer, who furnishes her with the extra print. For a window display, if on the ground floor, three or four large portraits with a dozen cabinets constitute a good display. These might be laid upon a covering of silkaline, which so nearly resembles silk, crushed into soft folds. This goods may be purchased in any of the delicate shades. Soft yellow is, however, the richest and most durable. Inside, a show-case or large table covered with a piece of plateglass the same size as the table, laid over the pictures, may be used. Displays should be changed frequently. A reception-room attendant should always be on time, and one of the first duties of the morning should be to plainly mark all negatives which have just come in, with proofs between, from the printer, with the order found in order-book, so that you may read at the bottom of the negative, written in ink, an order something like this: "Pierce, 1 Doz. A. P., No. 34,462." Another duty will be spotting of prints. The examining of prints for any blemishes and placing in envelopes ready for delivery. Two books are necessary at the desk, one for appointments and one for taking orders; the latter may be a register which contains space for, first, the number of negatives, then name, number ordered, style ordered, when promised,

amount paid, amount due. Every order must be registered here. A case for proofs should also be placed at the desk. Now we are ready for the customer. In a little booklet, which is most artistically gotten up, perhaps by the aid of the ambitious reception-room girl, entitled "Suggestions to Patrons," we would gently hint that from 9 to 11 A.M. is the best time for baby's picture to be taken; so by 9 o'clock, all duties of the early morning attended to, the reception-room clerk begins to listen for "footsteps on the stair" or the click of the elevator. Presently the voice and footsteps of a child mingled with those of the mother may be heard approaching. The clerk steps to the door and opens with a polite greeting, seeking at once for the chair which would be most comfortable for the mother, not forgetting one for the youngster. Especially should the mother be made comfortable if she carries a child in her arms. Just such a manner should be worn by the clerk as a hostess would wear for her guest. The expression the subject will wear when the exposure is made begins to form just here. If the patron is made to feel that you are a friend rather than foe, your pictures will be more widely sought. If the order has previously been taken when the appointment was made, nothing for the clerk remains to be done except to conduct the lady to the dressing-room and carry a copy of style and size wanted to the operator.

Have Pleasant Manners

As the subject returns to the reception-room after the exposure has been made, the same pleasant manner should be evident, and here the date for showing proofs may be set. If the day is a very busy one, so much attention may not be paid to each one, but the same gracious manner should always predominate. timid, self-conscious customer I would speak in a most kindly manner, endeavoring thereby to aid him in securing that assurance which would help him to decide what he wanted. To the reserved one I would state all necessary facts in regard to pictures and prices in a quiet, dignified way, without too much unnecessary talk. To the proud, haughty, better-than-thou creature I would say in the same way what was said to the reserved one, except that my manner would plainly indicate that I expected no impu-To the shallow creature, I would present my samples and let him know we had none of the characteristics so evident in his make-up, and to the brisk business man I should endeavor to be brief and to the point, showing him that we, too, were business-like, also.

In the taking of orders no fast-and-hard rule can be laid down, and the same is true of showing proofs. Here it is that tact as well as diplomacy is very necessary. Our success depends much on our experience and our experience more on our knowledge of human nature. We must present our larger work in such an attractive light that we can make the customer feel that that is what he wants. Keep small work, smaller than cabinets, entirely out of sight.

Price pictures singly rather than by the dozen; for instance, you might frighten a man clear out of the studio to say a group picture

such as he wants of his family costs thirty-six dollars a dozen, but rather say they are three

dollars apiece by the dozen.

Many do not know what good retouching does for a picture, and, unless proofs are slightly retouched before showing, a great help would be to have in the show-case a finished print, before and after retouching, from the most freckled face to be found. This at once modifies the effect of the harshness in the present customer's case. All proofs should be plainly marked as to changes desired, for the benefit of

the retoucher. Days upon which large crowds are expected upon the streets of a town or city the reception-room clerk should be unusually prompt and careful in preparation for the day. At all times she must make her employer feel that his financial interests are her interests, and if she wishes to please him especially, let her now and then suggest some good point on advertising; and, in a word, let her be tactful, making herself a necessity to the success of the business, and she need not complain for want of a position or because of poor pay.



VIEWS AND REVIEWS



War Prospects

As time passes and we get farther into the war, we begin to meet with the perplexities that accompany all trade at a time when the energies of the nations are centered on war. Each month brings up a new angle of view and new problems to solve, so that one must study the situation continually to know what is going on and what is

likely to happen.

The government has taken into its hands commercial control in a way that this country has never experienced before, and it is only natural that some people are going to resent interference with what have always been their individual rights, and possibly will be led into action to either disobey the rules or to try to evade them. In case the big corporations take this stand, the public rises up and condemns them vigorously, but where individuals act, there seems to be an idea prevailing that it is permissible. As a matter of fact, every one, rich, poor, large or small must obey the rules, and must take what is handed out by our government if we are to prove our patriotism and be successful in our part of the great struggle.

During war times there is an abnormal activity in the flow of currency, and while there is more money in circulation there is also an increase in the price of everything we need. In spite of the attempts of many to attribute this condition entirely to manipulation, we believe that it is merely a natural law being worked out before our eyes in a very big way. We believe that certain big men and corporations have taken advantage of natural conditions, and have manipulated them for their own personal benefit, but this has been due to foresight and the speculation on the probable trend of prices, rather than on any control. Where an individual or a corporation has exercised control and has sacrificed the welfare of the community for personal advantage, he should be reported to the authorities, and they have promised that they will vigorously prosecute any cases, irrespective of the standing of the culprit.

The activity of the money market will put more money into every one's hands, but each one will be working to get more of it, and probably just as many will come through the experience with no more left than they had when they went in. Others will make good use of the op-portunity, andwill manage to save something of the takings, and will be ready to meet the adjustment that is bound to come afterward. From purely a business stand-point, many prefer conditions such as prevail at present than such as prevailed some four or five years ago. Now it is almost impossible to get competent workmen, even at a high price. The workman is independent and asks a high wage, and even then the will give no more work than he can help. Several years ago, there was help going begging, and good help could be had for half of what is being paid for it today. But products were bringing a low price, and when all was said and done, there was but little left for anybody. But with all of the difficulties of the present time, it is generally agreed that we would rather see things as they are now than to go through another depression when half the workers are out of a job and business is dead.

The government has been gradually preparing us for greater restrictions than we are experiencing at present, and the prospects are both interesting and threatening. On account of the shortages of actual necessities, we may expect drastic rules any time for control of shipments. Food, coal and clothing will be given preference, and other lines of merchandise must take their chances of transportation with the expectation of being side-tracked in case there is an unusual demand for the necessities. Just now the cry is for coal, and many of us are very glad to let the railroads side track general merchandise if they will only haul enough coal to keep us from freezing. In some territories they are already doing this, and we may find that freight conditions will at times get worse with us.

This will mean that just at the time when we could sell certain goods we will not be able to get them, and, of course, we will each one blame some

one else for not supplying us. This will be the natural thing to do, but it will be unjust. We will be inclined to protest if some one else has goods and we have not, but an investigation will no doubt show that the other fellow was foresighted and provided himself in advance and, as he took a big risk, he, therefore, is entitled to the reward for

his foresignt and his task.

How will supplies for photography go? We do not know any more than the next man. In anticipation of transportation trouble we tried to anticipate, and were only partially successful. Some foods that we bought heavily have not moved, while others that we bought a generous supply of have been sold out dozens of times, and we could have sold much more had we been able to get it. Our experience appears to be exactly the same as many other merchants, and the element of luck is not to be overlooked. If we are to conduct business with any degree of profit and success, we are compelled to speculate to a certain extent, and when one speculates he must take his medicine like a man—pocket his profits if things go right, and pocket his losses if things go wrong. Be on the watch for possible trade hindrances, and in case any are threatened, use every endeavor to be prepared. Last summer we made fun of the man who laid in a carload of coal at \$7.50 per ton, for we were going to wait until the price came down and get ours for about \$5. We can now buy it for \$8.50, but we can't get it, and the cold weather got here first. Now we envy the man who has a coal shed full, and we forget how we ridiculed him for paying a fancy price last summer. We must not be too quick to criticize nowadays, for we are going through with the most unusual period of history since the world began, and if we were allowed just one guess, we would say that we are just beginning to feel our war experiences and we have a whole lot to learn before we get very much farther into it.—TRADE NEWS.

Central Dry Plate Company Moves

An event of peculiar interest to the photographic fraternity is indicated by the announcement, just received, of the removal of the Central Dry Plate Company from St. Louis city to their new factory at Benavis.

The new factory is located at what was formerly known as Woodland, eight and a half miles from St. Louis, and, it is interesting to note, located on the exact ground formerly occupied

by the M. A. Seed Dry Plate Company.

The new "Central" factory covers a ground area of almost nine acres, and is built for and devoted exclusively to the manufacture of dry plates. Following closely the design and general layout of the former Seed Company, no pains or expense have been spared to equip the building in the best and most modern manner for the work in view, i. e., the production of a definite and standardized product. All modern methods which would aid or assist in such production have been incorporated, and it is worthy of especial note that not until every department in the new factory had been tested out in actual practical work was the order given to dismantle the old factory. So closely was the change correlated that we understand not one single day's work

was lost, coaters from the old place simply reporting for work the next day at the new and resumed their usual occupation on the new machines; the same being true with the workers in all other departments.

It is the intention of the "Central" people to produce a complete line of photographic plates suited to every branch of the art. Special plates for color workers will receive particular attention, as will also a complete line of color filters for all

processes or methods.

A thoroughly equipped commercial research laboratory assures that no problem of general photographic interest will be neglected and that special requirements in any line will receive the consideration commensurate with their importance, while careful and intelligent supervision will at all times guarantee that the manufacturing departments will keep pace with proven scientific advances.

An Exhibition of Pictorial Photography

An exhibition of pictorial photography was given by the Clarence H. White School of Photography of the work of its alumni at the school, from December 18, 1917, to January 12, 1918. There were 166 prints shown, uniformly framed and mounted.

The work was, for the most part, of a higher order than that presented last year at the Ehrich Gallery. There were still too many designs or fragmentary exhibits, which are all right in class-rooms, but should not be classified with pictures that include many more or most of the features that constitute a pictorial composition. One noticed also that a number of the newer exhibitors bid fair to outclass the

older and well-known contributors.

There were some most excellent examples of pictorial art among the display. Mentioning these in the order of the very artistic catalogue: Florence Davey Banks, Hoboken, N. J., in "Sanctuary," offered a beautiful, toneful interior which made one regret that it was the only work of hers shown; J. H. Beaudry, Montreal, Canada, had a work of high class in "After the Storm;" Francesca Bostwick, New London, Conn., shows no falling off in her skill in "Dutch Study" and the familiar subject "The Canal—Bruges;" Margaret DeM. Brown, now of Jacksonville, Ill., exhibited an excellent "Portrait of My Grandmother," which would have been better if she had excluded some of the too many light spots; Mrs. C. M. Hall, Esopus-on-Hudson, was finely represented by "Candle Light;" Louisa Halsey, Metuchen, N. J., was best seen in "Plotters;" Mrs. Antoinette B. Hervey, New York, sustained her reputation in "The Bride;" George P. Lester, Bloomfield, N. J., rendered "An Old Fashioned Girl" in fine tone, but the figure could have been better posed; Charles J. Martin, New York, appeared to best advantage in "Portrait;" Florence Maynard, Boston, Mass., contributed "Public Gardens in Snow," with fine atmosphere and unique mounting; Cornelia B. McCoy, South Orange, N. J., in "Portrait" surpassed some of her past performances; Marion Meisel is always effective and her "Study of a Head" was no

exception; Margaret Rhodes Peattie, Chicago, Ill., pleased in "Seven A. M.;" Isabelle Phelan, Ill., pleased in "Seven A. M.;" Isabelle Phelan, Brooklyn, N. Y., furnished an admirable "Portrait—of Miss Betty Wilkes;" Marcia Stein, New York, presented "Ito"—too dark, but in other respects good. Mention must also be made of Edna Morse Walker, Scarsdale, N. Y., "Portrait—Mrs. Chester Beach and Child;" Margaret Watkins, New York, "David;" two pictures by Mabel Watson, Pasadena, California, one a "Portrait," the other the wellknown features of that clever writer and critic, Sadakichi Hartmann; Delight Weston, New York, "Reeza Wenclaw;" Marguerite E. Witte, New York, "The Refugee," and Amy Whitte-

more, Taunton, Mass., "Portrait."

The exhibition was well attended and awakened much appreciation. This was well deserved, for few if any have done more to advance pictorial photography than Mr. White, and many of his pupils do honor to this popular

teacher and exponent of photographic art.
Mr. Karl Struss, that gifted artist and alumnus, was missed greatly, but is now, as a second lieutenant of the U. S. aviation corps, serving his country rather than delighting his many friends. The absence of the work of another skilful artist, Mrs. Alice Choate, was regretted.

The "Welcome" Photographic Exposure Record and Diary, 1918

A FEATURE which will at once appeal to the purchaser of the new edition of this popular annual is the fine genré study taken "In the Pushcart Market" by the well-known New York

photographer, Mr. A. E. Churchill.

The other illustration shows how pictorial even war may be when it is photographed by an expert. It is entitled, "Out of a Cloud of Dust into a Cloud of Bullets," and it is a record of an incident on the Belgian front from the camera of W. Gore, who brings his experience in the Turco-Balkan campaign to bear on the present war, in the interests of *The Daily Sketch*, London.

As for the book itself, it is wonderful, especially in war-time, how its good features are maintained, and how it has been found possible to make this edition even fresher and more up-to-

date than ever.

Enlist Your Lens in the Army

People of the United States are asked to help the Signal Corps of the Army get lenses enough for cameras for the fleet of observation airplanes now being built. The need is immediate and of great importance; the camera lens

is the eye of the army.

German lenses can no longer be bought in the open market. England had to meet this same difficulty in the earlier stages of the war by purchasing the lenses of the required type from individual owners. England is now making lenses better than the German ones formerly imported, but no faster than needed for her own uses. The Bureau of Standards of the United States Department of Commerce is now perfecting a substitute for the German "Crown Barium" glass used for lenses, and American manufacturers will later be able to meet the needs with special lenses of new and improved

types now being designed for this work.

The present situation, however, is that the airplanes soon to be ready for service, suitable lenses cannot be bought. Possessors of the required types are urged to do their bit by enlisting their lenses in the service of the Army. They are asked to immediately notify the Photographic Division of the Signal Corps, U. S. A., 825 Mills Building Annex, Washington, D. C., of lenses of the following descriptions which they are willing to sell, stating price asked.

All makes of foreign lenses are needed, namely, of a working aperture of f/ 3.5 and f/ 4.5, with

focal lengths of from $8\frac{1}{4}$ to 24 inches.

The following are some of the foreign makes

wanted:

Government.

Carl Zeiss Tessars, Bausch & Lomb-Zeiss Tessars, Voigtländer Heliar, Euryplan, Cooke, Goerz, Moia, Bush, Ross, Ross-Zeiss, Krauss, Krauss-Zeiss, Steinheil-Tsostigmar.

In addition, matched pairs of stereoscopic lenses, with speeds of f/ 4.5, focal lengths of $4\frac{1}{2}$, 5, $5\frac{1}{2}$, 6, $6\frac{1}{2}$ and 7 inches, are needed.

Many people who own lenses, particularly amateurs, are unfamiliar with the specifications and immediately write the division regarding the lenses they have. This causes a flood of correspondence, which at times almost swamps the office. In order to avoid this the division suggests that where a doubt exists regarding the specifications to take their lenses to one of their local opticians, photographers or photographic dealers, who, no doubt, would gladly test them.

The lenses most needed by the Government are in the hands of professional, commercial and portrait photographers, who are reluctant to give them up. These photographers must be brought to realize that their Government should not be handicapped by them, and it is their patriotic duty to offer their lenses for use. There are many makes of lenses on the market that answer all the purposes of commercial and portrait photographers, and this fact has been proven beyond a doubt by photographers of great renown who have sold their lenses to the

The division recently asked a photographer in a large city to call a meeting of all professional, commercial and amateur photographers in his city and explain to them the vital necessity of the Government in securing high-powered Anastigmats of long focal power, and the results obtained in his city were wonderful. It is, therefore, suggested that a meeting be called in each city and the facts laid out clearly to the photographers that they will be brought to realize their country's needs. The division will be glad to render all the assistance possible in arranging such meetings.

"Motion-Picture Education"

By Ernest A. Dench. The Standard Publishing Co., Cincinnati, Ohio. Cloth, \$2.00, postpaid.

Motion pictures are playing today a constantly growing part in the education of the

people. They are being used more and more in connection with the work of schools, colleges, churches, hospitals, clubs, industrial plants, technical institutions, settlement houses, playgrounds, missions, etc. The uses to which the motion picture can be put are practically inexhaustible. What are these uses? How can I employ the motion picture in my work? What will it cost? Has motion-picture education any

All of the above questions—and a good many more—this book answers in a complete and practical way, besides submitting many practical suggestions for using motion pictures in new

and unique ways.

The author, who has written four or five motion-picture handbooks, is recognized as an expert in this field. His works are widely circulated and accepted as authoritative.

The War and Photographic Materials

It would be quite a mistake to suppose that the only influence of the war upon the materials used by the photographer is to make them more costly than before. It has been much wider in its scope. It has made it necessary for some of them to be distinctly different in character, while a few have become quite unobtainable.

Photographic materials fall in three main groups—plates and films, papers, and chemicals—and each has felt the force of the international hurricane. We often hear it asked, sometimes rather petulantly—"Why cannot we make so and so as well as the Germans?" the enquirer evidently believing, as the form of this enquiry shows, that he believes that we cannot. He

only wants to know the why.

Let us take the case of sensitive emulsions first. There are three great staples used in their preparation—silver nitrate, potassium bromide, and gelatin. The war has enhanced the value of silver, and, by cutting off supplies from the great potassium salt mines in Germany, has made all potassium compounds much dearer; but as far as these two products are concerned, it has had little other result. Silver nitrate is silver nitrate, whether it is made here or elsewhere; and potassium bromide is a compound of perfectly definite character irrespective of its origin. But gelatin is very different.

Gelatin has been on the market in many makes and many brands and grades, each of which has had its own peculiarities. The physical peculiarities of gelatin play a most important part in emulsion making, and plate makers with the experience of years know that not only is it of the greatest importance to them to use certain particular sorts of gelatin in certain determined proportions, but that they must watch the selected grades of gelatin which they are in the habit of using to see that they do not vary. Their formulæ and methods have been carefully adjusted to suit the particular materials experience has shown to be most suitable, and when the war came along, and those particular grades and makes were no longer to be got, there was trouble. It was not that other gelatin was not so good; it was different. Formulæ that had been

elaborated and tested in years of work had to be modified, and we can only say that we are surprised, not that there should be differences in the character of the products, but that they should be so few. It has been a very worrying time for the scientific staff of the big manufacturing concerns, and it is likely to remain so until things are again normal.

Then there is paper. Before the war there was a great organization on the Continent for the manufacture of paper of that particularly pure character which photography requires. Many other paper markers had attempted to compete with it, and there was a certain amount of raw paper from such sources in use. When war cut off the main supply the manufacturers of photo-graphic papers had to turn to these sources and kindred ones for the whole of their requirements. Once more they were able to get what they needed, but it was different; and in this case, undeniably, it was not always so good. result was further and continuous trouble.

The paper problem is more harassing even than the gelatin problem, because the characteristics, good or bad, of the gelatin, were at least to be ascertained while it was in use in the factory; whereas the paper might have latent imperfections which only revealed themselves in the course of time and after the goods had gone out on to the market. Since the war started this has happened to our knowledge several times, and imperfections and irregularities in the quality of the raw paper have had serious effects upon the emulsion put upon it. It seems that the thick material used for sensitized postcards is less dependable than the other grades, as defects have been more rife in postcards than in the rest. A great many of the troubles which photographers are now experiencing are due to this cause. The cards have been in perfect condition when tested at the factory, but from some defect in the base they have rapidly deteriorated.

There are minor troubles attributable also to the war. Glass is scarce, and getting scarcer, and it is becoming more and more necessary to clean off and recoat old negatives. Film spools are also in demand when they can be got in quantity. Card and boxes for packing are

expensive and difficult to buy.

Some of the chemicals used in photography are not quite the same in appearance as those to which we are accustomed. Hypo and sodium carbonate are now usually much coarser. Glycerin is not to be bought, and methylated spirit in small quantities is almost unobtainable. shortage of amidol and metol has been overcome, however; and pyro and other chemicals. are little changed except in the matter of price.

On the whole, the photographic manufacturers, in our opinion, are to be congratulated upon the way in which they have met and overcome troubles of a very serious character; and the user of their goods, if he finds now and again that they are not quite uniform in all respects with what they have been, will, we hope, regard that not as a grievance but as a reminder that the firms on which he has relied have had a time of very great anxiety and stress-how great what has been above written may suggest.—Photography.

Using the Camera to Illustrate Fiction

THE idea of illustrating fiction with photographs, says the New York Times, for which models are posed under expert stage management to represent the story's characters, has been developed recently and is attracting the attention of publishers and editors. In New York two illustrators, Lejaren A. Hiller and Henry Guy Fangel, have abandoned their drawing boards to

make a profession of the new method.

Both of these pioneers, however, frankly express the opinion that the camera can never equal the best work of the illustrator by hand. Perhaps this view is due to the fact that they were both illustrators of this type before they became photographers, and they both still amuse themselves in their spare moments by compositions with brush and pencil. At any rate, their regard for the magazine illustrator is considerably higher than that of the average reader who looks at the pictures with a story and wonders why anybody ever thought the characters looked like

"Our photographs don't look like other photographs," said Mr. Fangel the other day, 'but we have no new and secret method or process, with the exception of a private method of blending three or four negatives into a single print, which is very rarely used in the illustration of fiction. Such successes as we have achieved are due rather to the fact that, so far as I can learn, we are the first artists who have treated the camera as an instrument for the carrying out of artistic conceptions. A few portrait photographers have made mild beginnings in this line, but none of them has gone far, nor have they attempted to do anything beyond the mere photography of a single individual with a general idea of making him look like himself. In other words, practically all photographers so far have been mechanics who did not try to make the camera do more than the obvious thing which anybody could see it was meant for.

"We have regarded the camera as another tool which makes it possible for the artist to obtain some effects that cannot be obtained in other ways. There is room still for a great deal of development in the art; we hope to do a good deal of this development ourselves, for naturally we think we are doing better work all the time.

"We study the composition of a photograph as an artist would plan the composition of a drawing. We give special and careful attention to lighting, and we work often like stage directors to get the right expression on a model. But there is no new process which differentiates our

work from ordinary photography.
"Mr. Hiller began this work several years ago, when he was a magazine illustrator with an amateur taste for the camera. He used to do rather unusual things with his camera by way of recreation, and often showed them to art editors of magazines who would be interested. Eventually one of them gave him a poem to illustrate by photography, and the results led to continuation of the work and eventually took him out of his other work altogether. I was an art editor and bought a good deal of his output, and about two years ago entered into partnership

with him. Either of us can do all the other's work. What makes us successful partners, I should think, is that his tendencies are decorative and mine are realistic. We balance each other. Of late we have done a good deal of illustration for advertisements, but that is only a side line. Our principal work is still illustrating fiction and

poetry.'

Naturally, the illustration by photography of fiction with a wide range of subjects calls for many models. Where a pen-and-ink artist may do a whole year's work from three or four models, and a painter who specializes in covers may work with only one, the photographers have laboriously collected and card-indexed something like 3000. The outsider would be apt to think that most of these would be movie actors, but in fact only a comparatively small percentage are drawn from this class.

"If a movie actress can do work suitable to our proses," said Mr. Fangel, "it is apt to be by purposes," said Mr. Fangel, "it is apt to be by accident. Our work is so much more refined, our details must be so much more carefully done, than in the movies, where rough general effects are required, that the two have very little similarity, and a face which may take well in the movies does not necessarily produce results for

Some of the best-known actors and actresses on the speaking stage, as well as those from the pictures, are on the list of 3000, along with many artists' models, many working girls and men of various employments who like to make a little extra money in spare moments, and a considerable number—a rather surprisingly large number -of women who do it largely for amusement and the pleasure of being photographed with exceptional care in their best clothes. This last type, naturally, is used principally in "society" scenes where good clothes and obvious good breeding are essential. Some of these women find convenient use for the money that is paid them; though they may be well to do, others pose simply for their amusement.

The two "illustrating photographers" employ a scout who is sent out to the locations where suitable models for the character required may be found, but most of the new models-and the list of 3000 is receiving constant incrementscome through the good offices of those who have already posed and who spread the word that it is easy money for pleasant work. When a story deals with east side or rural types or some other specialized characters, the photographs do not reproduce made-up actors, but originals-real east side tradesmen, real farmers from the high

grass.

But it is not all easy work for the models. The makeup is done with extreme care, so that a model who is capable of transformation into adequate representations of different types may appear as something entirely different from his normal self, except in the case of characters where such accuracy is needed as can be obtained only by having a specimen of the exact sort of man portrayed. And the work of getting the right expression, to be held at the instant when the camera shutter is open, is something calling for a good deal of labor on the part both of model and director.

Professional Photographers' Society of New Hampshire

THE second annual get-together meeting will be held in Powers' Studio, Claremont, March 26 and 27. Although it is a little early to give any definite program we feel sure from all indications that there will be a very pleasant and instructive time.

Technical Photography and its Use in Industrial and Commercial Organizations

PRACTICALLY no active technical, industrial, or commercial organization is complete without a photographic equipment in one form or another. With the exception of very few large establishments that maintain a photographic department for the purpose of photographing salesmen's samples, etc., there was until recently no concern in which a photographic department was installed as a distinct unit of the business, whose function it is to serve all the other departments The author and the company as a whole. believes himself to be one of the first to establish such a department in a large corporation, and today that photographic department has become a necessity.

In a large project of this kind the manager should be not only a photographer in the fullest sense of the word, but should also have a technical education and an adequate knowledge of the business to be served. Besides an equipment for copying documents of various kinds and laboratory and field photography, there are many advantages in facilities for the production of color work and photomicrography in the commercial field. The cost of a complete equipment is considerable, but this can be installed

and developed by degrees in cases where the magnitude of the business served does not warrant a large expenditure. Perhaps one of the greatest difficulties of conducting a project of this kind is that of securing a duly qualified manager, and the author hopes to see established some day the profession of "Photographical Engineer," embracing the necessary theoretical and practical training for the purpose.—Journal of Industrial and Engineering Chemistry.

Photographic Subjects in Leading Periodicals

"Reducing Bromide Prints Dry without Abrasion," by T. H. Greenall, *Photography and Focus*, November, 1917, p. 327.
"The Laws of Fixation," by A. W. Warwick,

American Photography, November, 1917, p. 585. "Tanks for the Photography of Objects in Fluids," British Journal of Photography, 1917,

p. 579. "Focussing Images in Mirrors," Kodaking,

December, 1917, p. 25.

"An Outline of the Cinekrome Color Process," by A. S. Cory, Motion Picture News, December, 1917, p. 4060.

"Making Up Developers," British Journal of

Photography, 1917, p. 566.
"The Use of Photography in Astronomy,"

Kodaking, December, 1917.

"A Photographic Research Laboratory," by C. E. K. Mees, Scientific Monthly, December, 1917, p. 481.

"Colored Images Produced by Persulphate Reducers," British Journal of Photography, 1917,

p. 554. "Spotting," by S. H. Avery, American Photography, January, 1918, p. 8.



Correspondents should never write on both sides of the paper > No notice is taken of communications unless the names @ addresses of the writers are given > > We do not undertake responsibility for the opinions expressed by our correspondents



WORTH-WHILE LETTERS ON LIVE IDEAS

From One of Our Loyal Subscribers

January 1, 1918.

THOMAS COKE WATKINS.

Editor The Photographic Journal of AMERICA,

DEAR SIR: I have now completed thirty years unbroken subscription to your Photo-GRAPHIC MAGAZINE, having commenced in the fall of 1887. With the exception of two or three numbers, which were taken away from my studio (presumably for the frontispiece pictures). I have the complete file for the thirty years, which makes a good record of photographic progress during that time.

I am not now actively engaged in the business, but retain all my old love for it, and wish to

continue in touch with it. Yours truly,

CHARLES C. LEWIS.

Concerning Blisters in Prints

JANUARY 7, 1918.

TO THE EDITOR.

SIR: In the January number of the Photo-GRAPHIC JOURNAL OF AMERICA, pages 41 and 51, are two notes-one on blisters in prints, the other on a special hardener-which attracted my attention, and it might perhaps be of some interest to your readers if I should describe my

own technic in handling prints and plates.

The special interest of this technic lies in the fact that I never use a hardener for either plates, films or papers, and I am never troubled with either blisters or frilling. A description

follows:

Prints are exposed and developed in the usual manner, being then placed in an acetic acid stop bath, as usual, where they remain until the whole batch is complete. I have never

found any trouble to result from a prolonged immersion in this bath, prints sometimes remaining in it for three or four hours; that is, until the entire lot for the day has been developed. A fresh fixing bath is then made up, consisting of crystal hypo dissolved in the proportion of 1 ounce of hypo to 4 of water, and the prints are drained and placed in this one by one, being moved around for twenty minutes after the last one goes in. The tray containing prints and hypo both is then placed in the sink and the end of a hose is so adjusted as to give a good circulation of water and to insure that the prints are kept whirling and well separated. Washing lasts for an hour and a half, when the prints are taken out and put to dry. The idea of this, of course, is threefold: (1) a fresh, quick-working hypo bath is always certain; there is no possible question of the exhaustion of the bath; (2) the fixing bath is always cool, generally a little cooler than the wash-water, owing to the fact that the solution of the crystals chills the bath; (3) the hypo is eliminated from the prints gradually, so that the osmotic pressure is at no time great, and there is no tendency to lift the gelatin from the paper. This method has worked successfully for me in circumstances where the use of a hardening bath was not sufficient to prevent blisters.

My plates are developed in an Eastman tank—two tanks, to be strictly accurate, since I work with both 4 x 5 and 8 x 10. The procedure is the same in each case, however. After development the developer is poured out and the hypo—made up as above—is poured in, without rinsing. After standing for twenty minutes the hypo is poured out and the end of the hose is inserted into the tank, being passed down beside the rack to within half an inch of the bottom of the tank, and the water is turned on so that a vigorous stream results. After an hour's washing the plates are removed and set up to dry, the backing being swabbed from backed plates, with rinsing under the stream of

I do not claim that this technic will avoid blisters and frilling in all circumstances—it would probably fail in the tropics—and it may be that some brands of plate and paper would not work well with it. However, I do claim that with Artura and Azo papers and Wratten Panchromatic, Seed's L Ortho Non-halation and Standard Orthonon plates, I get neither frills nor blisters at any time of the year in the neighborhood of New York.

PAUL L, ANDERSON,

A Lighting Dodge

TO THE EDITOR,

SIR: The dodge of allowing the light to act slightly on the plate, to be able to do with a shorter exposure, is not to be despised, and made use of intelligently, will do good service. A means which is communicated to me

by a friend, and which I have not seen published, is to cover the largest stop with white paper, and cut out an opening the size of the stop generally used. The result is a softer negative, with one-third or one-half less exposure than if the opaque stop had been used. This action of diffused light lighting up the image, and thus reducing the exposure, often takes place when the photographer is not conscious of it. Years ago, when it was customary to make negatives of vignettes against a white background, it was found the exposure was considerably reduced. Again, the image may be lighted by reflection from the sides of the camera and from the surface of the lenses.

be lighted by reflection from the sides of the camera and from the surface of the lenses. The lighter parts of an image, the sky, for instance, will reflect diffused light on the inside of the camera, and thus light up the darker parts. Any landscape photographer may have observed that a view with much sky will require a less exposure than one from which the sky is nearly excluded. We all know that long exposure reduces contrast. Suppose we have before the camera a country residence, with overhanging porticos illuminated by a strong summer sun. The contrast is painful to the eyes; and still, by giving a sufficiently long exposure, we can reduce it so that the house appears to be bathed in the mellow light of an Indian summer day. How much of this may be owing to the diffused light reflected from the more illuminated parts?

CHARLES WALBACK.

January 17, 1918.

Drying Matt Prints

TO THE EDITOR.

SIR: E. C. Cripps gives the following method for drying prints flat and free from specks:— Obtain from the stationer a piece of "fluffless" white blotting-paper 18 inches in width, and from 3 to 6 feet in length. Also get from the draper a yard of "longcloth" calico, which is sold in a width of 36 inches. Cut this in half, and the necessary drying arrangement is ready. Lay the length of blotting-paper upon a *clean* surface, and over it place the calico. Take the wet prints, and after gently wiping the surface of each, place it face downward upon the calico, its length at right angles to the length of the piece. When all are down, carefully roll up, and fix the roll with an elastic band. It will thus be seen that the face of the print is on the calico and the back on the blotting paper. When dry, the prints can be peeled off with ease. If they are required to be dried very quickly, the roll can be placed in front of a fire, when about half an hour will be found sufficient.

Two precautions: Keep the calico free from folds or "kinks," and see that the blotting-paper is kept scrupulously clean and free from particles of dust.

JAMES F. FULLER.

January 8, 1918.



AN EXCELLENT EXAMPLE OF PHOTOGRAPHY FOR EFFECTIVE ADVERTISING



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PRINTING PHOTOGRAPHS UPON TEXTILE FABRICS

FILM NEGATIVES AND PLANE SURFACES

AN EXPOSURE SYSTEM FOR USE WITH SLOW LANTERN PLATES

CARBON PRINTS ON METALLIC SUPPORTS, WITH BRIGHT AND GRAINED SURFACES

TREATING DENSE NEGATIVES

CYANOTYPE

THE DEVELOPMENT OF CIRKUT FILM

PRACTICAL PRINTING METHODS FOR DEALERS

THE USE OF ALUMINUM SULPHATE FOR HARDENING PAPER AND FILM

THE RELATIVE HARDENING ACTION OF POTASH AND AMMONIUM ALUM

SULPHITE IN SOLUTION

BLOCKING UP A WINDOW FOR DARK-ROOM WORK

HIGH-TEMPERATURE DEVELOPMENT OF ROLL FILM, FILM PACKS, PLATES AND PAPER

PHOTOGRAPHING ON WOOD BLOCKS FOR ENGRAVERS

INTERMEDIATE TONES BY THE INDIRECT METHOD OF SULPHIDE TONING



THE WORKROOM

By the Head Operator



Bloom on Negatives, Transparencies and Prints

Some little time ago we had occasion to search through a number of old negatives for a particular one that happened to be wanted, and in the course of the search came across a very great number of examples of that annoying trouble which is best described as "bloom." This takes somewhat different forms, being in some cases a whitish deposit like the bloom which is admired on a ripe peach. In other cases it looks more like a tarnish, while it often assumes a silvery sheen and sometimes shows colors. Its appearance leaves little doubt as to what it is in the majority of cases. Nothing but a sulphide would be likely to produce such effects, but the cause is a little more obscure. If, however, we have a sufficiently varied number of examples, and know their history, it is not impossible to arrive at a clue.

The facts that we have been able to collect are as follows: The effect is to be met with in negatives, bromide prints, lantern slides, and uranium-toned bromide prints, and occasionally, under special, well defined conditions, is seen in sulphide-toned prints. In the case of negatives, varnishing is an absolute preventive, but unvarnished negatives frequently show bloom, even when kept boxed, if the storing place is in the least degree damp, while its appearance is almost inevitable and fairly rapid if a negative is left exposed for a few weeks to the atmosphere of a dark-room, especially a gas-lighted one. While boxed negatives may be safe for some years, a few weeks will be enough to produce the

effect if the negative is exposed. In the case of lantern slides the effect is rare, unless an unboxed slide is left exposed for some time. Boxed and finished slides very seldom show it, though they may develop other defects of a peculiar kind, due to their frequent exposure to intense heat. With bromide prints, again, the effect is somewhat uncommon, and we have only met with it in prints that have been framed and exposed to light for a very long time. uranium-toned prints it is not only common but may be considered inevitable, some time or another, if they are not varnished, and we are not possessed of any proof that even this pre-caution is a perfect prevention, though if the bloom, having once appeared, is removed, and the print is then varnished, we have never known the defect to recur. The incidental fact that the bloom can be removed is a rather important one, for it shows that the effect is quite superficial. In sulphide-toned prints the bloom sometimes appears on very dense parts of the image, when so far as we can tell, all the solutions, etc., are in perfect order, while, and this is a very suggestive fact, it can always be produced on such a print

by using a strong and stale sulphide bath which contains more than a certain proportion of hypo. All these various items of evidence point to one thing, namely, that the effect is due to light or atmospheric fumes, or the two together, acting on a silver salt of some kind, a certain degree of dampness accelerating the effect. In the case of uranium-toned prints we know that such a salt exists, for the toning naturally tends to produce silver ferrocyanide, while the process, as ordi-narily conducted, includes nothing at all likely to remove this compound. It can be removed by various solvents or fixing baths, and in that case the appearance of the bloom is certainly delayed, if not prevented altogether. Such extra baths, however, generally alter the color to such an extent that people do not like using them. Again, in the case of a stale sulphiding bath, we know that hypo exists, and if there is enough of it, is capable of dissolving the silver bromide or chloride image upon which we are working, the result being an immediate deposit of silver sulphide on the surface of the film. In both these cases the existence of a silver compound is certain, but in the case of an ordinary negative or plain untoned image the reason of its existence

is not so apparent.

If we consider all the details of the procedure to which the untoned image is subjected, it would seem that there is only one possible source of a superfluous silver compound, and that is the fixing bath, which, while it is acting, is itself a solution of silver in the form of thiosulphate. The effects of imperfect fixing are often dwelt upon. We are constantly being told of the existence of several thiosulphates, one of which is insoluble in water and can only be removed by the continued action of hypo. But the effects of ordinary faulty fixing are usually fairly obvious and fairly quick. If this is the fault it does not need years to provide the evidence. In a very short time we can see that the image is spoilt, and, further, that the defect is by no means superficial and removable, but, on the other hand, is quite incurable. All the same, there is nothing but imperfect fixing to which we can attribute the trouble of bloom, and the phenomenon suggests to us that quite perfect fixing is an ideal condition that cannot be attained by ordinary methods of working. We know that to remove the hypo from a plate by washing requires repeated soakings in fresh lots of water, and that even after several such soakings a very minute proportion of hypo still remains. Too little to matter, but just enough to be detectable by a very delicate test. In the same fashion it would appear that the complete removal of all silver thiosulphates from the film should require several separate soakings in fresh hypo solution, but generally a plate has only one, and we believe

never more than two. The inference is that practically every silver image contains in its film minute traces of silver salts liable to be affected by favorable conditions of moisture, light, and atmosphere. When a silver spoon shows tarnish, as it will do very readily, that effect is due to the formation of silver sulphide. But, even though the spoon may be deeply discolored all over, the actual amount of metal silver that is turned into sulphide is inconceivably minute and practically unmeasurable. In the silver image as ordinarily produced, and after taking all the usual precautions, it is not only possible, but likely, that there is relatively quite as much silver left in the form of unremoved thiosulphate as is affected on the tarnished spoon, and if we consider the thickness of the gelatin film it is probable that there is much more altogether. Any that exists in the interior of the film is, however, protected from outside influences; hence bloom only appears on the surface, for which reason it is readily removed. We have removed it very effectively with soap and water applied with a pad of wool, while a dry bromide print can often be cleaned quite perfectly with hard India rubber. As pointed out in the case of sulphide toning, the bloom is often more obvious on, and sometimes is confined to, the denser parts of the image, which is just where any silver thiosulphate compound is likely to be retained in the greatest quantity. In bound lantern slides the effect is uncommon, just because the slides are bound, and therefore more or less well protected from the atmosphere. Moreover, they are usually kept shut up in boxes away from the light, and also in a dry place to preserve their binding strips. Still more, they are very thoroughly dried at intervals by being used in the lantern. Bromide prints again are usually kept well protected, and in the few cases we have known of bloom it is quite possible that the fixing was just a little less perfect than usual. But also bromide prints are very often treated to clearing baths, and these may have some effect on the residual silver compounds. In fact, it would appear certain that they must have some effect, though what, is uncertain. Here we may draw attention to another point not yet mentioned, and that is that we have seen no sign of bloom on any negatives that have been reduced. Such negatives can nearly always be identified by their somewhat shiny surface, and their immunity not only affords confirmatory evidence of the truth of the theory of the cause of bloom, but suggests the advantage of using an extremely weak Farmer reducer as a form of clearing bath. In point of fact, such a bath is often used with positives, and this may in some measure account for their apparent freedom from bloom.

Possibly, however, the most important conclusion to which we can arrive is the benefit of varnishing. Some years ago this was an operation no ordinarily careful photographer neglected; nowadays it appears to be one that only extraordinarily careful ones carry out. There is, however, no doubt whatever that it is an extremely important one. With good dry storage there is, perhaps, little fear of bloom on

unvarnished negatives, but we cannot always ensure that ideal storage conditions are fulfilled, whereas the simple operation of varnishing makes things certain even under most adverse conditions.—British Journal of Photography.

Printing Photographs upon Textile Fabrics

Producing photographs upon textile fabrics such as cambrics, fine linen, and silk is a branch of photography practised only by the few, because the best formulæ for such work have been kept secret and the prices charged have been exceedingly high, especially when the production has been made upon silk. Moderate charges for this class of work would bring considerable custom to any photographer who would make such work a part of his business. Some photographers have abandoned fabric printing because of the defective formulæ, the results being satisfactory only when applied to landscape and marine views, while portraits have lacked the necessary half-tone necessary for an artistic production.

Some years ago preparations were made for the production of photographs upon fabrics of various kinds by the platinum process. This process dropped into disuse because of the uncertainty as to the depth of printing, this being entirely of the guesswork kind, so that when the result was unsatisfactory the piece of silk or other material became so much waste and loss.

The process to be described is one which can be watched at the time of printing, the correct depth being observed before removal from the printing frame. The half-tones are perfectly rendered, and the toning of the print may be carried out in any gold-toning bath, without any further preparation than the preliminary coating and sensitizing. One point of importance to be attended to in this class of work is extreme cleanliness in every operation. If the fabric is new and contains any sizing or stiffening, it must be washed out by rinsing in hot water, wrung out and dried.

It is advisable in this class of work to have two porcelain trays, kept especially for the purposeone for the preliminary sizing and salting, the other for the sensitizing. It is also advisable that the toning solutions should be made up about twenty-four hours before use, a richer color and uniformity being thereby attained. In the preparation of the various solutions distilled water only should be used, as common water usually contains many impurities, especially dissolved organic matter, which, if used as a solvent, is sure to give variable results. Developers of all kinds must not be allowed to come into contact with any kind of fabric that has been sensitized or during the operation of sensitizing, as spots and marks which cannot be erased will be produced through contact with the free nitrate of silver. If it is found necessary to stretch the fabric out flat, it must be laid upon a clean sheet of glass—not upon board, and not upon metal under any circumstances.

Having everything ready, make up the following solutions:

.\0.	1.			
Sodium chloride	COI	mm	on	
salt				100 gr.
Ammonium chloride				25 gr.
Magnesium lactate				125 gr.
Distilled water .				
Gelatin (hard)				

Allow the gelatin to soak for half an hour. Warm the solution so that the gelatin dissolves completely; soak the fabric in the above for a few minutes; then suspend to dry.

The sensitizing solutions are made as follows:

	No.	2		
Nitrate of silver				120 gr.
Distilled water	-	-	-	4 oz.
	No.	3		
Citric acid .				50 gr.
White sugar .				50 gr.
Distilled water				20 oz.

The dried salted fabric may now be placed in the sensitizing solution and allowed to soak for two or three minutes. Then withdraw the fabric, drain until it is surface dry in the dark-room or under yellow light. As soon as it is dry, draw it carefully through solution No. 3 and hang it to

dry. When dry it is ready for printing.

Linen, silk, or cambric may all be prepared at the same time with the same solutions. There is no need to fear contaminations. After sensitizing, the prepared fabric will not keep for more than one week. It must be kept under pressure in a printing frame away from the air. It is a better plan to print as soon as sensitized and dry. In practice it will be found to assist the work considerably to sensitize a strip of silk, linen, etc., so that a small piece may be used as a test upon the negative to be printed from. This will enable the photographer to judge the time necessary to produce a perfect print, which should be about two shades deeper than the finished print. An ordinary printing frame is all that is necessary, and, having made the test, a portrait can be printed by time.

When the print is made, all that is necessary is to wash it in several changes of water and proceed to tone exactly the same as for a paper print. A very good toning bath for this class of work is the borax bath made as follows:

	10	CILC	001	0022	Duci		1000	c u	, 10	110 000.	
5	Sat	urat	ed s	solu	ition	of	bo	rax		3 oz.	
1	Na	ter								30 oz.	
- (Chl	orid	e of	20	ld					2 or.	

As soon as the toning is complete, wash the article in two changes of water, and fix in a solution of hyposulphite of soda (2 ounces of hyposulphite to 20 ounces of water).

The fixing is usually accomplished in about ten minutes. All that is necessary now is to wash the fabric in a dozen changes of clean, cold water,

then suspend with clean clips to dry.

To flatten the fabric out so as to give a smooth and even surface it may be ironed out upon a clean cloth, but the iron must not be too hot. The final result will prove to be a highly satisfactory production, the half-tones being perfectly rendered. Excellent portraits can be made by this means upon every kind of linen and sllk, on the corners of pocket handkerchiefs, for the silk facings of cushions or as a portrait for framing.

If the material is very thin, the salting solution must be made 50 per cent. stronger. For articles of every other kind, the formulæ given will answer every purpose.

Film Negatives and Plane Surfaces

THE many practical advantages of the film negative over the plate are often discounted to some extent by certain inconveniences in manipulation, the more noticeable in the proceedings following development, fixing and washing.

Of these inconveniences the difficulty of obtaining a perfectly plane surface is perhaps the

greatest.

Hand work on an unsupported *pellicle* is a very vexatious business, and, fracture alone excepted, a film negative is more prone to injury than a plate negative.

Films will *not* always remain flat, a warm hand being sufficient sometimes to introduce an obstinate curl; except in straightforward contact printing anything of the kind is most tiresome.

These *obiter dicta* bring me to my subject proper, *i. e.*, a method of giving to, and maintaining in, film negatives a perfectly plane

surface.

In ordinary contact printing this is easily arrived at and needs no comment; it is in local operations to the negative that trouble arises,

and in enlarging.

In enlarging from film negatives the often recommended plan of sandwiching the negative between thin glass plates has never given me satisfaction, the additional thickness being usually too much for the carrier, necessitating a troublesome readjustment of the turn-buttons; nor does this method facilitate in any way retouching or other manual control of the negative. The degradation of the definition, unless a very high quality glass is used, is a fatal obstacle too with this method, if perchance, the utmost sharpness in the enlargement is required, as it may well be at times—in record work, for example.

Having used with scant success all the generally known ways of mounting films on glass plates, the perfectly plane surface, that will allow of continued hand work after mounting, had to be found I believed, and I cast about for a better

method

The first experiment consisted of attaching a film negative, sensitive surface outward, to a glass plate of larger size, using seccotine as an adhesive. Only the clear part of the film left by the dark slide rebate was seccotined, and this but lightly—just enough, in fact, to insure slight fixation—the shorter sides were alone treated, and the whole dried under fair pressure.

An attempt had now to be made to take up the bulging of the long sides, which, of course was

yet undiminished.

To do this a black paper mask was cut, very considerably larger than the glass support, to allow of subsequent trimming, with an opening exactly corresponding in size to the film negative. This, in turn, was attached to the glass support with dilute seccotine, the inner borders being carefully rubbed down on to the rebate marks on the film all round—the idea being that, when

dry, the paper mask would correct by shrinkage the uneven surface left by the first part of the

Greviously disappointed was I then to find that this shrinkage was not sufficient to effect the purpose an obvious result, of course; but everyone overlooks the obvious sometimes!

While turning the matter over in my mind there occurred quite a piece of luck that provided the solution of the difficulty.

In carelessly handling the work a soiled finger left a disfiguring mark on the film. This was removed presto with cold water and a swab of cotton-wool, wetting the film very thoroughly without disturbing its adhesion to plate or mask; the whole thing was then put aside as a failure.

Judge, then, of my pleasure some hours afterward, on again looking at the thing, to find my film, now dry, as flat as the proverbial pancake or, rather, a good deal flatter; it had no longer the smallest trace of departure from the most rigorous flatness over all its surfaces. On going over the film carefully I found it still unattached to the glass, except at the margins-a point of some importance, for, should the necessity arise, it is quite easy to remove the film without injury. Repeated trial of this method has always given the same result. I have only to emphasize the necessity of thoroughly wetting the film to prevent uneven action; if the edges of the mask have been well attached to the film there is no danger of the water getting behind it. The paper mask has the additional advantage of arresting vagrant light from the rebate marks-

a point, in enlarging, of great importance.

One objection may be raised to the idea. It is that, in drying, the glass support will take on a concavo-convex distortion. Theoretically this is so, but practically I have not yet found it of anything but academic interest, even when making enlargements of record work with very fine

detail on a large scale.

This method has been of the greatest service to me; one only has to employ it once to find how much work on the negative is facilitated, and how many elements of control it introduces. Upon these I need not dwell, they become self-evident.
—E. Manton in Amateur Photographer.

An Exposure System for Use with Slow Lantern Plates

Using two or three lantern plates to ascertain the correct exposure before making a perfect slide is not at all necessary. Even a single trial plate bestowed on such a purpose is wasteful, if we adopt an exposure system on the lines described below. The method has the double advantage of cheapness and simplicity, is perfectly reliable, and when once the standard slide has been made, requires no further use of lantern plates in making trial exposures.

If we have among our collection of slides one specimen which we consider practically perfect, and of which we have full particulars of exposure and light used, as well as of the distance from the light when making the exposure, well and good; the work is plain sailing. If we have no such slide, then we must perforce make one; for a

slide with a record we must have.

We therefore choose a likely negative, i.e., one which we are sure will present no great difficulty, and proceed to make a test slide from it, preferably by making a series of exposures on the plate, screening part of it, and so finding out exactly what exposure it needs. Having arrived at a satisfactory result, the typical or standard slide may be made. This must be tested in the lantern, as it is of the utmost importance to get it just right. Full details of exposure, the nature of the light, and the distance from it must be noted. If the slide is found to be quite satisfactory we may congratulate ourselves that no further tests with plates will be needed in any future slide making. Such a statement seems "tall," but the fact remains.

The next operation is to take the negative from which the slide was made and make from it a print on bromide paper. This need only be fixed, washing is not necessary. We carefully note the length of exposure, and the distance from the

light in this case also.

Let us suppose that the print and slide records then read something like this:

SLIDE.—Exposure of two minutes at 15 inches

from oil lamp.

Print.—Six seconds at 18 inches from oil lamp. It is obvious that if we make a print from another negative that happens to require exactly the same exposure as this negative did, then, in slide-making from that negative, we must also give the same exposure as we have recorded for the standard slide. If the bromide print takes half or double the exposure, then the lantern plate must be given an exposure in the same proportion. The platemakers give a scale of times for various colors, so that the tone or color of the slide need not receive our consideration.

There are certain rules to which we must ad-

1. The prints must always be made with a light of the same kind (oil, gas, etc., are available); if we start with oil, for instance, then oil must be used thereafter.

2. It is better to expose at a uniform distance, as calculations are difficult, seeing that the source

of light is not a point.

3. When getting a fresh supply of bromide paper, a piece of the new kind should be tested with a piece of the old (on the same negative of course), and the difference, if any, noted.

4. The plates should be exposed at a fixed

5. The same light should always be used for plates, though this need not be of the same kind as that used for the paper.

6. For different brands of plates fresh tests

must be made.

We may use daylight and gaslight paper for the print if we prefer it, but in that case we must test the light by meter.—*Photography*.

Carbon Prints on Metallic Supports, with Bright and Grained Surfaces

GENERALLY, when the photographer desires to produce carbon prints upon a metallic support, especially upon a bright and highly polished surface, he employs a preliminary coating of normal collodion, this coating being relied upon

as a substratum or go-between with the metal plate and the carbon print. This is especially so with a plate of copper that has been coated with silver and highly polished. For the production of carbon portraits upon bright copper or highly polished silver surfaces, the use of collodion is not necessary. Carbon prints upon metal surfaces are invariably produced by single transfer, so that the developing is made direct upon the metal. If the plate should be made of brass, nickelplated copper, or a bronze of almost any description, then it is advisable to use a preliminary coating of collodion. This is necessary because the chromic acid which forms the base of the bichromate of potash (used to sensitize the tissue) attacks the zinc contained in brass, or the nickel coating on copper, or any nickel alloy, combining with the nickel or zinc and liberating copper in a free state, giving spots and patches of copper upon the surface. Collodion being an inert body acts as a neutral layer upon the surface of the alloy.

The preparation of the carbon tissue does not differ in any way from the usual practice. A very good sensitizing solution for the carbon tissue to be used may be prepared as follows:

When the above are completely dissolved, filter the solution through absorbent cotton and sensitize the tissue by immersing it for three minutes. Squeegee the tissue down upon a clean sheet of glass, then suspend it to dry in a ventilated and darkened room. Having the tissue ready, it may be kept for use in a printing frame larger in size than the tissue by placing in the frame a piece of thick sheet glass covered with black paper. Put in the tissue, replace the back of the frame, and keep the tissue under pressure.

If it is desired to produce a grained surface upon, say, a plate of copper or aluminum, proceed in the following manner: Clean the copper plate well by dipping it into and rubbing it with a small rag mop dipped in a solution of lye. This solution is made by dissolving a small quantity of potash lye, about four ounces dissolved in one quart of warm water; allow it to cool off before use. The copper plate must be planished and polished previously. Having cleaned the plate with the potash lye, wash it well and dry. When dry, brush the back of the plate over with shellac varnish or asphaltum varnish. Allow to dry in a warm place. The plate should be handled by the edges only, the fingers not being allowed to touch the surface. The surface of the plate must now be rubbed well with a stick of charcoal, such as is used by photoengravers. Dip the plate and charcoal into water; lay the plate upon a smooth board, inclined over a sink so that in rubbing the surface backward and forward, the surface grinding drops into the sink. The graining is produced by immersing the well-cleaned copper plate into a mixture of

Nitric acid 1 oz. Water 20 oz. If the graining is to be coarser, the water must be reduced to fifteen ounces.

In the course of a short time it will be seen that the surface of the copper has been attacked by the acid. Rock the tray a little, and in the course of a minute or two remove the plate, rinse it in running water, then scour the surface with a fine brass-wire scratch-brush. This can be done by hand, or, if possible, use the rotary scratch-brush in a scrarch-brush lathe of a silver plater. The object of the scratch-brushing is to rub down any slight burr formed by the etching of the acid. The plate may now be washed by dipping into hot water. It will dry by its own heat.

If aluminum be employed, hydrochloric acid (muriatic acid) must be used instead of nitric, because nitric acid will not attack aluminum except at a high temperature. The proportion of hydrochloric acid may be the same, with the addition of half an ounce of common salt. This lessens the intense action of the acid. The scratch-brushing must be resorted to as before, rinsing the plate, dipping into hot water, and drying.

Assuming now that a carbon print has been produced upon the tissue in the usual way, all that is necessary will be to take the copper, silvered, or aluminum plate, and dip it in the lye. Rub lightly with a soft cotton mop, rinse in clean water, and as quickly as possible soak the exposed tissue. Dip the tissue and metal plate into a syrup composed of

White granulated sugar . . 1 pound Water 1 pint

This solution must be used only in a cold condition.

Place the soaked tissue and plate together; cover with a piece of India-rubber cloth, glazed side uppermost; place upon a level surface. Now apply a squeegee, lightly at first, then gradually increase the pressure at every stroke, not rapidly, but with a slow, heavy pressure. If several plates are used, some bright, some grained, the treatment is the same. Allow the plates to stand for fifteen or twenty minutes before developing. At the end of that period, place them in cold water, allow to soak for a minute or two, then transfer them to a larger tray containing warm water. Rock the tray so as to get rid of the air-bubbles on the surface. Take the first tray, half fill it with water of a somewhat higher temperature, take one of the metal plates out of the warm water, immerse it, then carefully lift the tissue from one corner. All that will be necessary now will be to throw the warm water over the surface of the plate with the right hand while holding the plate in a sloping position with the left hand. In a very short time the print will be fully developed. Wash it by dipping into clean, cold water; then immerse it in an alum bath compound of

Common alum 2 oz. Water 100 oz.

The plate must remain in this bath for not more than five minutes, because the film should not be hardened too much.

Proceed in the same way with the other plates, and after the alum bath wash them by laying them in clean water from tray to tray, giving five minutes' time to soak, so as to completely remove the alum. They then may be placed in a clean rack to dry.

Carbon prints produced upon bright silvered plates have very much the same effect as daguerreotypes with this exception, the portrait may be seen at any angle, hence they have often been called daguerreo-carbons. Prints produced upon aluminum have an exquisite velvety effect, being at the same time absolutely permanent.

Treating Dense Negatives

This is a chapter for beginners, a number of whose queries with regard to the reduction of dense negatives indicate to me that, in spite of all that has been written in the text-book on this subject, there is still much misapprehension of the right procedure to follow in bringing an overdense negative to convenient printing depth and incidentally of improving its defect of insufficient or excessive contrast. And this brings me at the outset to distinguish, for the benefit of the beginner, between the two broad classes of dense negative.

The Dense Flat Negative

The one is a negative which, though dense, is Such a negative is produced more frequently at the present time, now that development by time is more widely practiced. It is, of course, the result of over-exposure of the plate, but the time-development system has the merit of continuing development considerably beyond the point at which the unexperienced worker, if he were left to himself, would take it out of the developer because he saw the image "going all Let me tell the beginner that in such a case the best thing to do is to let the negative "go all black." By so doing you do build up in the film an image which actually acquires more contrast the longer you develop, though you can't see it for the layer of superficial fog which the continues development induces. You can, however, very largely get rid of this superficial fog and often disinter a negative which is of quite presentable printing quality.

The Dense Hard Negative

The other kind of dense negative is one which is the result of over-development of a plate which has received fairly correct exposure, or perhaps has been exposed a little on the under side. In that case continued development leads to excessive hardness of the negative, or at any rate to a degree of contrast which renders the negative unsuitable for printing by most processes—practically by all processes, with the exception of carbon. I ought perhaps to except also bromide paper, in exposing and developing which a great deal can be done in the way of obtaining harmonious prints from negatives of such excessive contrasts. But generally speaking straightforward printing calls for a negative which is not of this excessive degree of vigor. It is difficult to describe these different types of negative in words. I can usefully refer the reader to the excellent series of reproductions accompanying the article by Mr. C. H. Hewitt in the 1913 "B. J. Almanac." Fig. 3 there gives an idea of the sort of

negative obtained by reasonably long develop ment of an over-exposed plate, while Fig. 3a shows the kind of print produced. Fig. 4, on the other hand, shows the kind of gradation produced by over-development and Fig. 4a the description of print resulting from it.

Reducing Dense Flat Negatives

These two types of dense negative require entirely different treatment in reduction. What will benefit one will aggravate the evil in the case of the other. Let me take the dense, flat, overexposed, well-developed negative first. The thing to do in this case is to use the hypo-ferricyanide or Farmer's reducer in strong form—that is to say, with a generous addition of the ferricyanide solution. No need to bother about any exact A solution of hypo containing from formula. 2 to 4 ounces hypo per 20 ounces water is placed in a measure and a fairly strong solution of ferricyanide added a few drops at a time until the mixture is of fairly deep orange color. Avoid using old hypo bath instead of plain hypo solution; also avoid any acid fixer containing sulphite or metabisulphite. The negative can be put to soak in this solution, but a far more effective plan is to apply it by going over the negative with a pad of cotton-wool soaked in the reducing solution. And have as little of the reducing mixture on the cotton as you can. Saturate the cotton in the reducer and then squeeze out most of it again. In this way the reducer will clear off the surface fog to a remarkable extent. Let it act on the negative for a short spell only, say twenty seconds, then rinsing well under the tap and applying the cotton-wool again after a further dip in the reducer. Two or three applications of the reducer in this way will bring down the density of the negative and at the same time will improve its contrast, as a result of the characteristic action which the ferricyanide reducer has upon the lighter parts of a negative as compared with the heavy deposit in the high-lights. By applying the reducer in successive stages with ample rinsing between each we avoid the production of yellow stain to which the reducer when used of great strength is somewhat liable.

It all depends on the amount of contrast there is in the image proper whether this reducing process is sufficient of itself or requires to be supplemented by intensification of the negative. If over-exposure has not been too excessive and the plate has been thoroughly developed the reducer alone will serve to yield a negative which is fairly clear in the shadows but still has sufficient density in the high-lights. In the alternative the negative requires to be well washed and further contrast obtained by intensifying it by any of the convenient formulæ, such as the Lumière iodide of mercury or the chromium intensifier.

Reducing Dense Hard Negatives

On the other hand, the method of treatment for a negative which possesses an excessive degree of contrast and at the same time has full density is by a reducer which has exactly the opposite effect to that of hypo-ferricyanide. Ammonium persulphate is the reducer which is the best for this purpose. In the case of negatives which are

both hard and of full vigor its action is usually quite satisfactory, although it is difficult to account for its erratic behavior at times in the way of failing to exert a regular reducing action. The solution requires to be freshly made and to contain about 20 grains of the persulphate in 2 ounces of water, with the addition of a drop of sulphuric acid. A thing which must be watched for in using persulphate is that the action, unfortunately, makes a spurt toward the end, and therefore the plate requires to be removed somewhat before it is judged that sufficient reduction has been obtained and placed immeditely in a 5 per cent. solution of soda sulphite, which promptly stops the action of the persulphate. Another point: if the negative has undergone any considerable degree of reduction it is well to pass it for a minute or so afterward through an ordinary fixing bath in order to clear away any partially soluble silver salts which may have been

formed by the reducer.

I must confess that I am not particularly fond of the persulphate reducer, and in the case of a hard negative would sooner deal with it by the modification of what long ago was named the "re-halogenization" process, which was devised a year or two back by Mr. Welborne Piper. It consists simply in bleaching the negative in the ordinary mixture of bromide and ferricyanide as used in sulphide toning, washing thoroughly and re-developing with a non-staining developer strongly restrained with bromide. formula is: Azol, 1 dram; 10 per cent. bromide solution, 5 drams; water, 6 ounces. In this developer the plate regains its density very slowly, so that it is an easy matter to arrest it at the required stage. The trouble with the old process was that in re-development you got the original degree of contrast almost before you knew where you were. The modified method is perhaps a little tedious, but it calls for no particular skill beyond taking a look at the negative every now and then and removing it when it has reached the lesser degree of density and vigor.-British Journal of Photography.

Cyanotype.

Among the processes that call for attention as being suitable for war-time use, in view of their inexpensiveness, the ferro-prussiate or cyanotype printing process can be regarded as taking very high rank. Last week we discussed the carbon process, in which hot water only is required as a developer, and which has many other advantages in regard to considerable control and the securing of a large variety of colors. The cyanotype process, on the contrary, requires cold water only as a developer, and is even more economical in practical use, but is restricted in the matter of color, the normal print being a bright hue. This may suit certain subjects, and for decorative work it proves extremely successful at times. But normally the blue print is not entirely suitable for the average subject. Fortunately, however, the color can be changed, as we will show later.

Although cyanotype paper can be purchased already sensitized, it is so extremely easy to prepare that the amateur will be quite safe in sensitizing his own, particularly as practically any kind of paper can be used. Ordinary good writing paper or cartridge paper is very suitable, for instance. The sensitizing solution is made as follows:

A		
Ferric ammonium cit	rate	1 oz.
Water		 4 oz.
В		
Potassium ferricyanio	le	 200 gr.

These solutions should be kept in the dark and kept separate. The ordinary stone ginger-beer bottles are good for this purpose. Equal parts of A and B are taken for use, and before making up the solutions care should be taken to see that the green ammonio-citrate of iron is being employed (this should be obtainable from any high-class chemical manufacturer, such as Johnson's). Also see that the potassium ferricyanide is in clear crystals. If not, the crystals should be rinsed in plain water until clear, before being weighed.

If the best and brightest prints are required, and the paper used has not a well-sized surface, a coating of arrowroot is to be recommended. This

is made as follows:

This should be mixed with a little cold water, and a pint of hot water added. It is then boiled in a porcelain dish, with constant stirring, and put aside to cool. The mixture should be strained through canvas and applied with a soft sponge. When dry the paper is pinned to a board and the

sensitizing solution applied.

The sensitizing solution is spread over the paper with a pad or brush, working in one direction, and then across to even the marks out. The paper is then hung up to dry, and appears of a greenish-yellow color; and where the light acts on it, it turns blue. After exposure it is merely washed in water, when the image becomes bright blue, and the ground or unexposed portion should remain quite white. Over-printed proofs may be reduced, after thoroughly washing, by being dipped into a weak solution of ammonia or a 2 per cent. solution of sodium carbonate, well washing, and then dipping into weak hydrochloric or acetic acid and well washing. Underprinted proofs may be intensified by immersion in a solution of ferric chloride or nitrate or sulphate of iron, 3.5 parts to 1000 parts of water, till the image appears darker in color, and then well washing. Corrections, or taking out spots, etc., can be effected by touching the dry prints with a 4 per cent. solution of oxalate of potash, with which also titles may be written; and if red aniline ink be added to the above, or 4 parts of oxalate be dissolved in 100 parts of the red ink, the title will appear red on the blue ground.

For successful blue printing the negative should be of the distinctly strong or vigorous order. The method of gauging the printing is a little difficult to those who have had no practice, and the common mistake at first is to underexpose considerably. During its exposure in the printing frame the paper gradually changes through bluish green and bluish gray to dark olive green, and, when fully printed, has a choked

up, almost metallic appearance in the shadows.

The paper is all the better for being dried as quickly as possible after sensitizing, and, if it is not placed where it is liable to be actually scorched, may be hung near to a fire, with the object of expediting the drying process. In a moderately warm and well-ventilated room it will dry in from half an hour to an hour, and can then be put aside until printing is commenced. When dry it is, of course, sensitive, and should be kept from strong light.

Unless special additions are made to the sensitizing solution, the paper will not keep in good condition more than a day or two. A little bichromate of potassium, about half a grain per ounce of sensitizer, will, however, greatly improve matters in this respect; but the paper is so readily sensitized and dried that the addition of the bichromate is really unnecessary.

The blue image when obtained can be converted into an ink image or brown-black by soaking first in 5 per cent. carbonate of potash solution, washing, and then immersing in a similar strength of tannin solution; a good brownishblack color is obtained by immersing the prints direct in a saturated solution of carbonate of soda, mixed with an equal quantity of water, to which has been added as much tannin as it will dissolve. It has been suggested to immerse the prints in weak hydrochloric acid to clear the whites, then in weak ammonia, finally in a bath of alum 10 parts, tannin 1 part, water 130 parts; expose the prints to sunshine for ten minutes, and then bathe in dilute ammonia.—Amateur Photographer.

The Development of Cirkut Film

CIRKUT film may be successfully developed at normal and at high temperatures by the tray or tank method, and likewise on an apron at normal temperatures.

For tray development, a long, flat, wooden tray covered with rubber cloth is especially recommended. For purposes of travelling it is a simple matter to construct a collapsible tray with a removable lining of rubber cloth which may be rolled up into a small space.

For deep tank development a wooden tank lined with cloth is recommended, and such a tank is especially suitable for development at high temperatures when using formalin.

It is possible to develop, fix and wash Cirkut film on an apron at temperatures up to 75° F., but for this purpose a specially thick apron is required, which must be perforated and covered with a suitable fabric to permit of the access of the various solutions to the back of the film. When developing on an apron it is necessary that the paper leader should adhere to the film through the various operations, and in order to ensure this it is necessary to use a waterproof sticker of cotton fabric.

For rapid work Cirkut film may be successfully dried by means of a saturated solution of potassium carbonate, and it is considered that this suggestion will be of value to men working

at conventions and the like.

The instructions previously issued for the tropical development of N. C. film apply to the development of Cirkut film also.—*Eastman* Kodak Laboratory Report 441.

Practical Printing Methods for Dealers

The average photographic dealer looks upon gaslight printing as something of a bugbear, and when one considers under what circumstances the work is often done, such a conclusion is reasonable. And yet properly undertaken it should be a real pleasure, even though the negatives printed are not one's own, and consequently the interest in them is fleeting.

Gaslight or Daylight

A question often asked by dealers, as well as amateurs, is whether daylight or artificial light is the better exposing light. A long experience of some twenty years prompts the reply that the latter is the better method of exposing the negative. The work can be done by daylight, but the results are very variable, and the tones obtained often lack the richness possessed by those made by the other process.

Then, too, the developing must be carried out in a dark-room, and it is not always convenient, especially in these days of shortage of assistants, to shut oneself up in the daytime to do this work. Still if it is desired to use daylight, it will be found wise to remove the red window in the dark-room and cover up with several thicknesses of tissue paper, before exposing. Generally a "flash" is quite sufficient to expose the paper to this light, and the writer always recommends that when once the exposure is found, all the negatives should be printed straight away and afterward developed in a batch.

A word of caution is here necessary. The average dark-room is rarely free from hypo, which is often liberally distributed over everything. It is usually only when the work is finished, and one comes out into daylight, that the alarming discovery is made that stains and queer markings have made their appearance, due to this "good servant but bad master." The duster or towel upon which the fingers are wiped is usually the source of contamination, and it is well to use a fresh one every time new work is commenced.

Classifying the Negatives

A very important point to notice, if it is desired to get the very best out of the negatives entrusted to one's care, is that more than one "grade" or speed of paper must be used. It is impossible to use one kind of paper for all negatives, shortening or lengthening the exposure as the case may be, to make up for the deficiencies of the negative. It is a good plan to sort up all negatives into at least two or, better, three classes.

There is the under-exposed, or often "plucky" negative in which contrast is very marked, with tones varying from the clear glass of the shadows, to dense deposit in the "high-lights." It is obviously quite impossible to get good results on the ordinary speed of paper, and a "soft" grade should be chosen. Another class of negatives is the reverse of this. It is usually the result of over-exposure or under-development, and is "thin" or "flat" with little contrasts. Here a "hard" or vigorous paper should be used, and often such a negative from which its owner has never been able to secure a good print, will yield with a suitable paper quite surprising results. There still remains a third class of negatives to be dealt with, and these are the very dense, often over-developed, or stained by pyro in the developing bath. A very fast grade of paper is required for these; in fact it may be found expedient to use bromide paper.

Printing and Developing

The negatives once classified, exposure is fairly easy. The writer's method, when single-handed, is to expose the whole of the batch first. It will of course be wise to make one or two trial exposures, but once these are made, and the time is found, the whole lot may be printed, the papers being turned face downward in an empty plate box or some spot shielded from the light. There is nothing better than an inverted incandescent gas-burner, provided electric light is not available, and a few seconds is generally sufficient, varying the distance as the negatives are thin or the reverse.

Development is not a difficult matter provided the exposure has been carried out satisfactorily. The solution must be freshly prepared, and the correct quantity of bromide of potassium, as specified in the formula given by the makers of the paper, must be used. The freedom from iron and other contaminations of the carbonate

of sodium must also be assured.

Each piece of paper should be pushed rapidly and smoothly under the surface of the solution or some prefer to have a tumbler, wide-mouthed bottle or measure into which the liquid is placed after each operation, and from which it is poured on to the fresh piece of paper. If working single-handed it is wise to always keep one hand for the fixing bath, say the right, and to use the left for the developing bath. In this way there is no chance of contamination from hypo. Prints should be pressed under the solution by means of a stick of wood, glass stirring-rod, or better still a sort of drum-stick with a piece of rubber cloth over the head.

The fixing bath needs a special word of caution. It should always be strongly acid. Many of the stains and marks which appear on gaslight paper are due to this bath not being sufficiently acid to neutralize the alkalinity of the developer, and so stop its further action. One is never sure of freedom from stains unless an acid fixer is used.—

Photographic Dealer.

The Use of Aluminum Sulphate for Hardening Paper and Film

EQUIVALENT amounts of potash alum and aluminum sulphate exert the same hardening action on gelatin, two parts by weight of aluminum sulphate being equivalent to three parts by weight of potash alum. Commercially pure aluminum sulphate is satisfactory if this does not contain too much iron, though if the sample is at all acid the solution should be neutralized

by adding ammonia until a faint permanent precipitate is obtained. When mixing the usual liquid hardener formula with commercial aluminum sulphate a slight milky suspension is formed, but this is harmless and settles out on standing.—Eastman Kodak Laboratory Report 443.

The Relative Hardening Action of Potash and Ammonium Alum

THE hardening action of potash and ammonium alum on gelatin has been measured by comparing the degree of swelling and the change in melting point of gelatin films treated with solutions of the two salts. No difference was observed between ammonium alum and potash alum in their hardening action when substituted weight for weight in the usual hardening formula. In practice, if any differ-ence in hardening action occurs, this is due to the use of an impure ammonium alum, in which case, providing the impurities are harmless, an increased amount of ammonium alum should be used to such an extent that its content of aluminum sulphate is the same as that in the potash alum called for by the particular formula. When using ammonium alum, if the fixing bath becomes alkaline by virtue of a neutralization of the acid by the developer carried over, ammonia will be liberated, resulting in the production of dichroic fog and stain. No trouble will be experienced, however, if care be taken to keep the bath acid.—Eastman Kodak Laboratory Report 444.

Sulphite in Solution

The deterioration of sodium sulphite in solution has been frequently discussed, and the use of potassium metabisulphite as a preservative of solutions of sulphite has hardly been mentioned. I consider that the deterioration of the sulphite is usually caused by its alkaline state, which is made worse when it is mixed with sodium carbonate. If the carbonate is kept in a separate solution, it will keep indefinitely; and if the sulphite solution has potassium metabisulphite added to it in the proportion of half an ounce of metabisulphite to each two ounces of sulphite, the sulphite solution also keeps indefinitely. I have just used some pyro-metol made up about six months ago, thus

Sodium sulphite			2 oz.
Water			20 oz.
Metabisulphite			$\frac{1}{2}$ OZ
Pyro			40 gr.
Metol			30 gr.

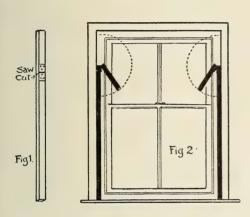
The carbonate was in separate solution, three ounces to the pint of water. Equal parts of the two solutions were mixed for use. The solution was only slightly discolored, and did not stain the negatives in the slightest. I also use the same principle, in making up developers of the amidol type, for bromide paper. I make up the following solution:

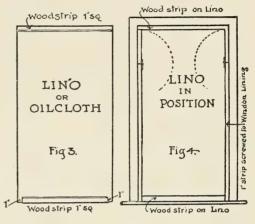
Sodium sulphite	$1\frac{1}{2}$ oz.
Potassium metabisulphite	$\frac{3}{8}$ OZ.
Potassium bromide .	14 gr.
Water	20 oz.

I find this keeps perfectly, and on the addition of the dry amidol, two grains to the ounce, it gives prints of a fine color, even after six months. In fact, it keeps indefinitely. I might mention that the above pyro-metol developer never stains the fingers. Until I adopted this plan I mixed the carbonate and sulphite together, and got yellow negatives after it had been kept a few weeks. Now the negatives are always free from stain.—Frank H. Rolph, in *Photography*.

ever is used must have sufficient stiffness to keep in place, and, of course, must be quite opaque.

To block up the window all one has to do is to catch hold of the bottom strip of wood, and, with the hinged flaps open at the top, to slide the lino down behind the strips like a blind, and then to push up the hinged pieces again, which will hold it securely in position. It does not take half a minute to block up a window in this way, or to open it. If a red light is required it can be pro-





Blocking up a Window for Dark-room Work

MATERIAL required for the fitting described here is easily obtainable at very little cost. It consists of four pieces of one inch square wood. two of them being one inch shorter than the height of the window between the sill and the top lining, one the exact width between the linings at the top, and one two inches shorter than the width between the linings at the bottom. There will also be required one pair of back flap hinges, a dozen screws of suitable length, one piece of floorcloth or lino, and a few tacks.

To construct the fitting, the two longest strips have screwed on to them, about nine inches from one end, the two hinges; and when this has been done the strips are cut through at the hinge with a fine tenon saw (see Fig. 1), taking care not to blunt the teeth of the saw on the metal of the hinge. This plan is much to be preferred to that of cutting the wood first and putting on the hinges afterward: as it prevents the wood from splitting, and ensures the joint being exactly right.

The two pieces so prepared can then be screwed to the window linings, as shown in Fig. 2, allowing a little more than the thickness of the lino between them and the window frame. This constitutes the whole of the fitting as far as the landlord's property is concerned.

The other two strips of wood are tacked one at each end of a strip of lino of the size required, taking care that the bottom piece is exactly centered and the fitting is complete. The material used for the purpose need not necessarily be linoleum, although this is likely to be the most suitable fabric that is readily obtainable. What-

vided by cutting a suitable opening in the lino with a sharp knife and gluing over it a couple of thicknesses of ruby fabric.—*Photography*.

High-temperature Development of Roll Film, Film Packs, Plates and Paper¹ (Abstract)

Roll film, film packs, and plates, whether new or date-expired, may be successfully developed under tropical conditions (up to 95 ° F.) by means of most developers, with the addition of 10 per cent. sodium sulphate and some potassium bromide in order to prevent fog, but much better with a special developer compounded with paraminophenol hydrochloride. Although it has been recommended to develop film in the tropics by hardening the same, either before or after development, by the addition of a hardener such as formalin, it is only possible to secure the best results by using a developer free from such addition agents. The formula for the developer is as follows:

Rinse for only one or two seconds before placing in the fixing bath, otherwise the film is apt to soften in the rinse water.

The time of development with Eastman N. C. film at 95° F. for normal contrast is one and a half minutes, though the time of development may be doubled by the addition of 100 grams of sodium sulphate (crystal) per liter of developer.

¹ Communication No. 62 from the Research Laboratory of the Eastman Kodak Company.

At temperatures up to 75° F, the regular acid fixing bath should be used, but at temperatures up to 85° F. the following chrome alum bath is necessary:

	Avoirdupois.	Metric.
Нуро	. 7 oz.	200 gm.
Sodium sulphite		
(E. K. Co.) 1 oz.,	175 gr.	40 gm.
Potassium chrome		
alum 2 oz.,	350 gr.	80 gm.
Acetic acid (glacial) .	. 40 min.	2.5 c.c.
Water to	. 32 oz.	1 liter

Dissolve the sulphite and chrome alum together and add to the hypo solution, finally adding acetic acid.

At temperatures up to 95° F. the following formalin bath should be employed:

Нуро	Ayoirdupois. 9 oz.	Metric. 250 gm.
Sodium sulphite	1 oz., 350 gr.	50 gm.
hyde 40 per cent.) Water to	$4\frac{1}{4}$ oz 32 oz.	125 c.c. 1 liter

First dissolve the hypo, then the sulphite, and

finally add the formalin.

In order to eliminate the odor of the formalin, the bath should be enclosed in a covered tank if possible. The above baths keep well at the temperatures stated, so that for the professional and amateur finishing trade the special chrome alum bath is very suitable, while in special cases, such as expeditionary work, when very high temperatures may prevail, the formalin bath will give perfect results.

Film packs may be successfully treated in a tray in the same way as N. C. film, though so far it has not been possible to devise a method for using the kodak film or film pack tanks at

the temperatures named.

Although no difficulty is to be expected when developing gaslight and bromide papers at high temperatures, the use of a stop bath of 3 per cent. acetic acid and twice the usual amount of liquid hardener in the fixing bath is recommended.

Photographing on Wood Blocks for Engravers

PHOTOGRAPHY has been called an unlimited science. This may be to some a strong assertion, but nevertheless it is a true one, and we have only to consider some of the various ways in which it is applied to trade, to be able to comprehend its magnitude. By the power of photography we have our books, periodicals, newspapers, etc., illustrated in a manner that leave nothing to be desired; the beauty of processes such as photozincography, photogravure, halftone etching, photo-lithography, collotype, and various others too numerous to mention, must be admired by all who have a taste for art, whether that taste is natural or acquired. It is not our purpose here to consider any of the above methods of producing pictures, but only to confine ourselves to photography on wood blocks for engravers. We must first consider what

engraving is; not only engraving, but wood engraving, as there are various branches of the art, such as copper, steel, calico, and silver engraving. A wood engraving is one cut out of boxwood by the graver or tool, in lines that are either straight, curved, waved, or broken (crosshatched being the proper term) according as the subject may require. In flat tints the lines are cut consecutively, the same thickness and depth, so that the result when printed shall appear without a flaw; the lines vary from 30 to 200 per inch, as the block varies in price. Before the engraving can be proceeded with the picture must be either drawn, transferred or photographed on the wood. In order to show the advantage of photography I will give the method of procedure necessary where the work is done entirely by drawing. We will suppose the sketch to be ready supplied, this is then traced on tracing paper with a medium pencil from the original, the pencilled side of the paper is then put on the face of the prepared block, and with a steel drawpoint or tracer the back of the lines gone over, which leaves a dim reversed image on the white ground of the block. It is then drawn in outline and shaded on the wood, according to the original on paper. It is then ready for the engraver. Transferring is much quicker than drawing, but a duplicate print must be provided, as the first print will be rendered useless. The damaged portions must be made right with the pencil before cutting the block. The transfer may be a lithograph; in that case a proof is pulled from the stone and pressed down in contact with the engraving surface of the block and allowed to dry before cutting, as the ink is easily blurred when wet. By photographing the subject direct on to the wood a truer representation of the original is obtained and with much more speed.

We have now reached the subject of our title, and as there are numerous ways by which the same end can be accomplished, they shall be described in detail, so that anyone having the desire to try them may do so. It may be as well here to mention that a copying camera and a good rapid rectilinear lens are indispensable, the better the lens the better will be the picture on the wood.

A film must first be prepared to carry the

sensitive salt; this is composed of:

Gelatin .				124	gr.
White soap				124	gr.
Water				1.5	OZ.

The gelatin is soaked in the water for a few hours and then dissolved in a warm water bath; the soap is then added gradually and allowed to become thoroughly incorporated with the gelatin. One ounce of pure zinc white is then added to the solution and finally strained through a piece of muslin. The wood block is coated with this solution, which must be thoroughly rubbed into the pores of the wood. It should not be too thick, but should have sufficient body to prevent the silver entering the wood; this will be found rather difficult and requires time and patience to accomplish successfully. When the coating is thoroughly dry, coat it with the following solution:

Albumen .					1 oz.	
Ammoniu		oric	le		18 gr.	
Citric acid	l .				3 gr.	
Water					7 dra	ms

This is best applied with a broad camel-hair brush. The block is again dried and sensitized with a silver solution of 50 grains to 1 ounce of water; pour a little on the center of the block and spread it evenly with a glass rod; when dry, print under a reversed negative. When printed, the surface is dipped in a strong solution in common salt for a few minutes. After washing it is dipped in a concentrated hypo bath. Then wash well under the tap, exercising care not to allow the back or sides of the block to absorb too much water or the block will be ruined by warping; to prevent this it is best to coat the sides with common soap or tallow.

Another method in which the image may be

Another method in which the image may be printed on the wood is the following: Coat the wood with a little zinc white and albumen, polishing it evenly with the heat of the hand. It is then coated with the following solution:

Ether .					5 oz.
Alcohol					5 oz.
Pyroxyline	9				20 gr.

When the pyroxyline has dissolved, 75 grains silver nitrate dissolved in a small quantity of water is then added. The wood is coated in the same manner as collodionizing and allowed to dry. If the block is wanted in a hurry or a brighter image desired, this coating can be dissolved off with ether and alcohol mixed in equal proportion, with a little absorbent cotton. This is allowed to dry, when it is again coated in the same manner as before, dried, and printed upon under a reversed negative, and fixed in a bath of concentrated hypo or cyanide of potassium. This is a more satisfactory way than the previous one, simple to manipulate, and can be printed in about twenty minutes on a dull day. For these methods a special printing frame is required.

A knowledge of the wet plate process is essential to the successful working of another process, which I shall now describe, and it will not be out of place to give an outline of it. It is necessary to have tools and chemicals all ready and in a convenient position; the following may be mentioned: 4 ounces M. and S. collodion, 2 ounces silver nitrate, ½ ounce potassium iodide, 1 ounce pure nitric acid, 1 ounce potassium cyanide, 2 ounces absorbent cotton, 3 ounces alcohol, 1 pound iron protosulphite, 3 ounces glacial acetic acid, 1 ounce citric acid, 2 halfplate dipping baths and hooks, 1 bottle of white mucilage, 1 roller squeegee, the albumen from one egg, and some glazed black paper. The directions for the silver bath and developer are given on the label of the bottle containing collodion

To begin work, we immerse the glass plate in a weak solution of nitric acid for twenty minutes, then wash under the tap with a small quantity of washing soda, the latter being afterward thoroughly removed from the plate; it is then allowed to dry in a warm current of air and afterward polished with a clean chamois leather. The surface intended for collodionizing must

not be touched with the fingers after polishing, and must be entirely free from dust. The plate is held by one of the corners with the foreinger and thumb of the left hand in a horizontal position, the end fartherest away from the thumb being slightly raised to allow the collodion to flow gently and evenly downward, the collodion being poured from the bottle on to the plate at that end, the surplus is run from the bottom corner into the bottle, the plate being rocked gently at the same time. This operation can be performed at the dark-room door in daylight; if that is not convenient, it must be done as far away from the gaslight, in the dark-room, as possible; as soon as the collodion sets on the plate, and before it becomes dry, it is immersed in the silver bath, which makes it sensitive to actinic light (daylight, of course, must be excluded during this operation). Care must be taken to flood the plate all over at once. Having allowed three minutes for sensitizing, it can be withdrawn, and if the solution flows freely over the plate it is ready for exposure. This is done while the plate is wet, and must be done quickly, as the plate dries in about five minutes. When the exposure has been made the plate is developed in the hand, held in the same position as when collodionizing, the developer being poured on evenly and quickly, which requires dexterity and decision. With gentle rocking the image soon appears, but to dry-plate workers has the appearance of being thin; when the negative is developed so far, it is washed gently under the tap, when the water flows freely over the negative, it is redeveloped (according to the formula on the collodion bottle), during which process it becomes considerably strengthened. It is then again washed and fixed in cyanide of potassium, and finally once more washed and dried. Care must be taken in using the fixing bath not to allow it to have access to any cuts on the flesh. It is also advisable to avoid inhaling the fumes therefrom. This is how wet plate negatives are made, but the photographer on wood deviates from this after-development (unless the picture has been made from a negative supplied; in that case the manipulation is complete, with the difference that a transparency instead of a negative is produced). Instead of redeveloping the image, it is fixed at this stage, the result being the thin negative required. It is now necessary to have this film transferred to the wood. The wood block is evenly coated with a pinch of lampblack and albumen in the same way as previously described, the black being substituted for zinc white. After coating, the surface is flooded with alcohol, to which a light is applied and allowed to burn until exhausted. The surface is then polished with fine glass paper, during which operation the negative has been drying. A piece of black glazed paper (the size of the negative) is coated with white mucilage and immediately placed on the film side of the negative, this is squeegeed down into close contact with the film and allowed to stand one or two minutes until it becomes tacky, the paper is then cut round with a sharp knife about one-eighth of an inch from the outside. These strips are taken off, and if the mucilage is sufficiently dry, they will bring the film immediately underneath

away with them. The image is removed from the plate and will be found adhering to the glazed paper. The block is coated evenly with albumen and the paper is pressed into close contact with the film side down, to the wood with a roller squeegee. It is a neck-to-neck race as to which will dry quickest, the mucilage or the albumen. The back of the paper is moistened with water, and if the albumen has won the race the film will be left on the wood, the paper coming away beautifully; but if the mucilage has won, you are inclined to make remarks more forcible than polite. In the event of a transparency being made, the only difference is that zinc white is used instead of lampblack.

This is what is done by the engraver in photographing on wood, as it gives more detail, sharper images, and no chemicals are used on the wood

to destroy or deteriorate its value.

Intermediate Tones by the Indirect Method of Sulphide Toning

FURTHER experiments with the permanganate bleaching solution in sulphide toning of bromide prints show that it is quite easy with this solution to get intermediate tones free from double toning by stopping the action of the bleaching solution at any point and immediately sulphiding. The most suitable strength to employ for this purpose appears to be as follows:

Common salt 40 gr. Permanganate of potash solution (2 gr. to the oz.) 4 dr. Sulphuric acid (commercial) 10 min. Water to make

The ingredients are to be kept in separate solutions and mixed at the time of using. As the action is very rapid it is important to take all precautions to flood the print evenly and keep the dish moving. It is also very important that the bromide print be thoroughly and uniformly wet before flooding with the permanganate. time required in the permanganate in order to obtain any given tone will depend partly on the character of the print, but it may be taken that a print would tone to warm black if bleached for one-eighth the time required to bleach a similar print completely out in the same solution. Thus a print which would bleach entirely in one and a half minutes would tone to a warm black if treated with the permanganate for about ten seconds only before sulphiding. A similar print treated for twenty or thirty seconds would tone to a brown. It is hardly possible to notice the action of the permanganate on a print immersed for ten seconds until it has been sulphided, but prints treated for twenty or thirty seconds will appear as though partially reduced. In a fully bleached print the image disappears entirely.

On removal from the permanganate solution prints must be put straight into the sulphide of soda solution, which instantly destroys any permanganate in the print and at the same time sulphides the image, or they may be quickly and thoroughly rinsed and put under water until later. They must not be put in any clearing solution until after they have been sulphided, but should any brown tinge remain in the paper after sulphiding they may be given a bath of 1 per cent. solution of oxalic acid containing a little sulphite

of soda to whiten them. It will be found that as the prints dry the tones will become colder, and prints which are rather weak for sepia toning are more satisfactory in one of the intermediate tones. In fact, the tone obtained by stopping the bleaching just before the image disappears entirely is usually the most satisfactory, and differs but slightly from the final tone. The warm black tone is also a most useful one for a large number of subjects, and is obtained with the greatest ease, provided the action of the permanganate is limited to ten seconds.

Although this is not the only bleaching solution which may be used for the purpose of obtaining intermediate tones, its advantages lie in its extreme cheapness, and in the fact that having to be used fresh for each print its action will be always constant, provided the solutions are accurately compounded. In my previous communication I referred to the use of permanganate as a combined hypo-eliminator and bleacher for sulphide toning, but it must be understood that refers to the full and complete process. When partial bleaching only is desired it is obvious that hypo-free prints should be employed.—T. H. GREENALL, in *British Journal of Photography*.

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PICTORIAL FACTORS

By MAX FERRARS

THE effect considered most important in modern photography is atmosphere. The sharpness and minute refinement once so striven after are now sacrificed to this. Before considering the meaning of atmosphere more exactly, let us turn for a moment to "picture." By picture we mean something that appeals to our artistic sense, in contradistinction to a mere representation of something seen.

We may argue that the temperament shows the artist; but such reasoning brings us no nearer the point. Let us inquire as to the *effect* of the artist's temperament. First of all, it invests an otherwise commonplace object with an original conception—the conception of character gifted with penetration, imagination, and love of beauty.

By the reproduction of an impression made upon one so gifted, it becomes common property. If we regard a portrait of Bismarck for instance, by Lenbach, we see more than a faithful likeness of the original; we see more than if the original were before our very eyes; we see with Lenbach's eyes, because he not only reproduced his impression, but toned it himself.

Raphael would still have been Raphael even if he had no hands. Why? for he would have understood how to see! The poetic disposition consists in seeing, hearing, feeling, and, above all, in the conception of what is seen. It is not alone an appearance in nature, but the glamour of poetry by which an imaginative spirit will surround its representation, which transforms it into a work of art.

The natural appearance (view?) would be the same whether we looked at it from an upright position or standing on our heads; but stand the picture

(99)

upside down, and it becomes incomprehensible and much more difficult to copy. For the copy will be found, on being placed upright, to have lost most of the significance of the picture, even if it be, from a photographic point of view, a fac-simile of absolute accuracy. In looking at the upright representation we should have unconsciously absorbed the characteristic points of the picture; we should possibly have added to their significance by our own conception of the same. Every reproduction of an object is an interpretation, a half-unconsciously revised version, substituting for the literal truth the universal probability.

This reproduction, "though a temperament," affords us more pleasure than the mere original; for it is a triumph of mind over matter, as it were—a work of art impressing us with the sense of power, and all the more so for the simplicity of the means by which the effect is gained, besides which the pleasure of

seeing is a lasting one.

A beautiful appearance in nature is the result of various happy accidents, in many instances purely transitory; these favorable conditions may be immortalized by the artist, while the unfavorable ones, although just as liable to occur, will be passed over, and never more disturb the harmony of the impression.

To attain this harmony a painter may modify the details of the subject according to his fancy, omitting some altogether, emphasizing others which add to the significance of what he depicts; but the photographer is only able to gain this end by waiting for and studying the phase which will give the desired effect, and by carefully selecting both distance

and point of view.

The harmony of a picture is founded on the different effects of contrast—light and shade, coloring, depth, and sharpness. Every form of contrast is a form of expression. This means of expression we dare not underrate, seeing that every pictorial representation is considerably less in intensity than that which it represents. In copper engravings the deepest shadows are put in solid black, and it is the saturation of the pigment which gives these engravings the advantage over others. We make use of the most exten-

sive scale of tones, first, because even so our means of expression are very limited; and, second, because it saves our eyesight.

The contrast between an object in deep shadow and one in bright light is not nearly so striking either to the eye or the plate on a flat surface as it is on a modelled one. The use of weak graphite or any weak color is generally a confession of failure; it may possess certain advantages, but these are counterbalanced by the disadvantages.

Some modern photographers attempt to conceal flaws by these means, using gray in gray, yellow on white, etc. if those periodicals which sanction such methods were printed in yellow, the circulation would surely cease, as the strain of reading them would become so great. And what about yellow illustrations? Next to the quality of *strength*, the work of the artist with a purpose should be distinguished by breadth. On looking at an ordinary photograph with bushes in the foreground, we find the same scale of tones repeated on every individual leaf. From right to left, as far as they reach, each has the same high-light and the same patch of shadow. And so it is in the middle distance and in the background. Atmosphere is entirely lack-At first the public was so charmed by the accurate drawing of photography as to overlook this fault, but since then its eyes have been opened. The disadvantage has been met by some with careful selection of lighting; by others, with trickwork.

To the artistic eye, however, this artificially attained effect of breadth is superficial and of no value. The painter as we have before remarked, may succeed in producing that breadth in which the subject was lacking by means of considerably modifying the light and shade. To the photographer this is not possible. He must preserve this most important quality of breadth by means of selecting lighting which distinctly separates the various planes of the picture.

The effect of breadth is produced by allowing the principal masses to stand out from the less important patches of dark or light, instead of forming a confusion of meaningless shapes. Each mass should be allowed its proper "value" according to the distance from

the eye in which it is found.

By this management of *contrast* it will be possible to attain the effect of color as well as of tone. The extremes of highlight and shade, which distinguish an object as belonging to the foreground, must on no account be brought into the middle distance. One means of attaining "values" is the consideration of the varying sharpness of outline. In nature, near objects will, of course, appear clearly defined; those in the background blurred or "lost." This gives us the various planes. The attain-

ment of breadth, not of the real article, but of the breadth achieved by means of general fogginess, rough paper, and flat negatives means the sacrifice of other important qualities. These tricks cannot alter the feeling against the harmony found in the photograph taken by chance. A favorable effect of massing a happily-posed silhouette gives a better impression, but they are counterbalanced by the discords.

Strength, tone-values, softness, and delicacy are means of expression, by the proper use of which, combined with breadth, the harmony and poetic influence of the picture arrive at their true

significance.

PORTRAITS OF CHILDREN

BY O. H. BOHÉ

FEW better opportunities for the attaining of charming studies by photography are ever brought before the camera worker than that presented by the interesting subject of

child portraiture.

The photographer who possesses a genuine love for children and a keen appreciation of the many little things that only children can do and say has his way already paved for him to success. Particularly so is this the case if he add to these qualifications an abundant supply of patience and the faculty to grasp and take advantage of the occasional happy situations that his little subjects unconsciously fall into while at play before the camera.

At the outset the first step necessary is the securing of their confidence. This can readily be obtained by displaying a little tact in approaching them. The best way is to take them quietly at the beginning, and avoid plying them with too many questions if a tendency to shyness asserts itself—in fact, it is much better to leave children of this type to themselves for a time until they become accustomed to the surroundings

and the strangeness wears off. When this point is reached, by interesting them with the explanation of some new toy or the like, their attention will be diverted and the fact of your presence gradually forgotten, or, at least, accepted as a necessary evil.

The common error made by many operators in handling children is that of approaching them too abruptly. Although it takes a little more time at the commencement, it is far better to devote a few minutes longer at this time, cultivating your little sitter and working him into the proper frame of mind necessary for the rendition of a pleasing portrait, before the camera is even touched. Once you have his good will and have been accepted as a newfound friend, the rest will be plain sailing. His interest must be held, however, and quick work done while you still command his full attention. Better make few plates while you have him in this interested state than to prolong the sitting after he has become visibly tired and restless.

Unless an unusually intractable case presents itself, the actual time consumed

in securing the different positions is but a matter of few minutes; the point is getting him in a desirable state of mind first, and then losing no time in making your negative while the spell is on.

When a little fellow is brought into the studio for a sitting we usually adopt the following method: After the customary grooming that always is deemed necessary by the anxious nurse or attendant, he is ushered into an apartment fitted up expressly for his reception. this play-room he is allowed full swing and amuses himself in various fashions until we are ready for his sitting. It is among these surroundings that we first make his acquaintance, and as much time spent with him here as is considered sufficient to secure his interest in what is promised to follow. Very little trouble is experienced with the majority of subjects, after explaining to them a brief outline of what will be expected of them, to get them to enter in the full spirit of the undertaking. Occasionally, when a stubborn child is met who absolutely refuses to be swayed by your choicest blandishments, rather than disturb his equanimity, his sitting is made right here in this room, which is in reality a smaller operating-room. But instances of this kind are rare. Meanwhile, the larger studio has been prebackground pared. and accessories placed in readiness, and the camera. which is closed in to resemble a bookcase, stands in position with the slide drawn. When the young hopeful is led in, but little urging is required to get him to occupy the space arranged for him; this is usually by a small chair or table upon which some article liable to prove of interest is placed in order to attract his attention.

Frequently a number of poses can be gotten while he is thus amusing himself and is quiet for the fraction of a second required for the exposure. Mechanical toys interest children greatly, and by having a good collection on hand some one of them will particularly strike his fancy and be the cause of calling forth a variety of expressions ranging all the way from a smile to a yell. Once in a while a subject comes along who has passed the stage of being attracted by

toys; it is then that a good stock of little stories or the knowledge of a few simple tricks will likely prove of advantage. We have had youngsters who have put us to our wits' end in studying up some scheme in order to arouse them into some degree of animation without result, and then, accidentally, before our stock of patience had entirely left us, stumble across some little trifle that we had previously overlooked which would have the effect of arousing them instantly into a being of life and action. One little fellow I have in mind, who gave us a severe tussle after trying every conceivable object, only gave signs of possessing an intellect when his mother happily remembered his great fondness for pins, and supplied him with a saucer full. It is needless to add that the proofs selected were from the plates made after the pins appeared.

While almost the entire success of a child's portrait depends upon securing a natural and suitable expression, the effect of light and shade, composition, and arrangement must be taken into account before the production can rank as an artistic piece of work. Backgrounds and accessories should be kept simple and unobtrusive, avoiding the introduction of any lines that would detract from the importance of the figure. We find that more satisfaction is gained from the use of plain light grounds and keeping the accessories, if any are to be used, of a character

similar in tone.

As children are usually gowned in light colored material, the result of this arrangement masses the lights in the picture, and brings the only darks about the head, where the interest should be centered. An effect of this kind has a dainty appearance quite in harmony with the characteristics of the little people represented.

The question of allowing the friends and relatives who frequently accompany a child to assemble in the studio at the time of sitting is a much discussed one. Whether it is advisable to let them stay depends entirely on the people themselves. Sometimes they can render valuable assistance, but more often their presence has the effect of dividing the









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child's attention. When it is impossible to exclude them without offending, the better policy is to make the best of it, and direct their efforts to where they can be used to good account. Outline your plans to them quietly and briefly, and caution them to appear only when instructed to do so. If you go about your work in a thorough manner they will soon have confidence in your ability, and realize that to interfere would be to jeopardize the success of the sitting.

Notwithstanding the many drawbacks and petty annoyances constantly met with in the portraiture of children, personally I derive more genuine pleasure

in photographing these little people than in all the other branches of the art combined. Once in a while, after an unusually trying ordeal with a real tartar, I am about ready to take part of this back, but probably the very next little tot will be a perfect jewel, and more than make up for the shortcomings of his predecessor, and serve to strengthen my convictions all the more. To the photographer with a responsive chord to all the winning traits that childhood is capable of, their coming and going will be remembered as just so many bright spots during the day's work, instead of the bugbear it often appears to some.

PHOTOGRAPHY APPLIED TO SCIENCE AND INDUSTRY

By GEORGE H. RYDALL, B.Sc.

PHOTOGRAPHY is often considered merely as something of the nature of a luxury. Even a few moments of careful consideration will suffice, though, to dispel this idea. Photography may be, and often is, purely a hobby; but it has most important and valuable utilitarian aspects, particularly in the regions of science and industry.

The applications of photography to science are manifold. Without photography, science in many of its branches would not have reached its present advanced stage. The eye is a very valuable and useful piece of optical apparatus to a human being, but as a scientific instrument it possesses very serious limitations, and even when assisted by the telescope and the microscope, the eye still suffers from its natural limitations. It is easily liable to overstrain, and viewing operations cannot prolonged because of this. Moreover, features seen by the eye with the aid of the telescope or the microscope are never recorded by the eye with all the detail revealed that lies in the image produced. But the photographic plate does not tire with exposure, and prolonged exposure of the plate in conjunction with a telescope or a microscope, within the correct limits, enhances the value of the recorded image finally obtained. The field of view recorded by the photographic plate used under such circumstances is also often much larger than that recorded by the eye, and what to the eye, assisted by a powerful telescope, may appear to be a blurred mass of nebulous matter in the heavens without any particular form, is revealed by the photographic plate acting as the eye at the telescope, to be a world in making. And most important of all, photographic records are permanent and may be studied at leisure.

The application of photography to modern medical science, in conjunction with x-ray apparatus, would, if the account of it were written, provide one of the thrilling stories of the war.

The value of photography for recording observations made in aëroplanes has been repeatedly brought to public notice, and information of the most valuable type and of extreme military importance has been repeatedly gained in this way. What is generally

unknown, though, is the value of photography in connection with the construction of the aëroplane itself. It is this that the writer would particularly like to emphasize, as it has a most important bearing on the application of

photography to industry.

The war has led to the development of the aëroplane as nothing else would or could have done. From a stage of infancy the aëroplane has grown until it has become a machine which, with a little assistance, will almost control But the machine must be strong and as light as possible. The bulk of the weight is concentrated in the engine. It was here therefore that the problem of combining strength with relative lightness had to be solved, and the solving of this problem has led to most remarkable changes in the iron and steel industries, and also in other metal industries. The methods of procedure in many works have been revolutionized in order that material fulfilling the required specifications should be manufactured.

The properties of metals are dependent on the constituents of these metals. Commercial metals are never pure. Some impurities are added purposely in order to impart certain desirable properties to the metals. Other impurities are present because their presence is unavoidable. Their presence may be harmful or otherwise. That is determined by the way in which the metal in question answers to certain practical tests. Some ready method of studying the composition and structure of metals is therefore of the utmost importance to metallurgists. A chemical analysis of a metal is often resorted to. Such an analysis will indicate what substances are present and in what quantities they are present, but it will not inform the metallurgist how these substances are distributed in the metal. That is to say, the chemical analysis of a metal will reveal its composition but not its structure, and the latter is of extreme importance commercially.

The examination of the internal structure and constitution of metals and alloys will reveal much regarding their nature and behavior, and such an

examination is undertaken principally by the aid of the microscope. From a study of specimens of a metal prepared for microscopic examination, not only can the chemical constituents of the metal be determined but, what is of the utmost importance, the internal arrangement of these constituents can also be The microscopic appeardetermined. ance of a suitably prepared section can, of course, be studied directly by the eye, but in order to obtain a permanent record which can be studied at leisure, a photograph is obtained. Photomicrography is therefore of very great importance to the metallurgist and is, in consequence, a most valuable commercial asset.

The preparation of a cut section of the metal under examination, having a plane surface for microscopic inspection, presents more difficulty than the preparation of a cut section of a rock. In the case of a rock a cut section has to be prepared which is sufficiently thin to allow light to be transmitted through With metals this method is impracticable because, owing to the opacity to light, the cut section would have to be so extremely thin that there would be the utmost difficulty in grinding and polishing it. Moreover, the operations of cutting, grinding, and polishing a metal alter its structure to a certain depth below the surface. It is evident, therefore, that to examine such a thin cut section of metal as would allow even a small amount of light to be transmitted through it, would so alter the internal structure of the specimen that the examination would not indicate the correct structure of the original sample of metal, and so would be, to a large extent, valueless.

The use of roentgen rays has been tried for the purpose of penetrating cut sections of alloys which contain constituents of considerably different densities. A thicker section could, under these circumstances, be used. At the time these experiments were made, though, the technic of radiology was in its infancy, and so the results obtained were not as satisfactory as they would probably be now, were this method adopted again.

For practical purposes it is only possible to carry out a microscopic study of metals by viewing suitably prepared surfaces of sections by reflected The choice of the section to be subjected to microscopic examination depends upon the particular object to be attained by the inspection. For instance, the object might be to get some insight into the constitution of alloys, or the effects of the rate of cooling on the variations in the chemical composition of different parts of a mass The influence of the mechaniof metal. cal treatment of metals can also be studied in this way, as the structure varies with the method of treatment.

From the stand-point of the metallurgist, the whole value of the photomicrographs produced depends upon the fact that they reveal the cause of excellence or defects and failures in metals under test, when they are properly understood. Defects and failures are due to the presence of undesirable constituents in the metals, the presence of desirable constituents in unsuitable quantities, or to wrong methods in mechanical treatment or heat treatment of the metals. Since strength combined with lightness is essential in the material used for aëroplanes, much research work has been carried out in order to ascertain what constituents and what methods of treatment are most desirable in order to provide the required type of metal. Hence photomicrography has proved to be of great service in this direction.

It is often necessary to overcome the small residual defects which exist in the optical corrections of the lenses used in the apparatus, especially when the photomicrograph required is one of a difficult subject. Monochromatic light is therefore made use of. This is

obtained by the introduction of a suitable light filter, and is aided also by "stopping down." In preparing photomicrographs it is generally desirable to produce photographs showing contrasts as clearly as possible. Some workers forget, though, that it is important also to get all possible detail in the photomicrograph. Plates and developers need choosing carefully, and in no branch of photography are so much skill and patience required as in this.

One other useful application of photography in connection with the study of defects and failures in metals and alloys is in the preparation of what are known as "sulphur prints." The presence of sulphur in steel is highly undesirable. Sulphur occurs in steel in a combined form as sulphide, and the distribution of this compound can be readily studied by pressing a sheet of bromide paper against a roughly polished surface of the steel. The paper before use is soaked in a 10 per cent. solution of sulphuric acid in water. The steel is thus exposed to the action of this dilute acid and every particle of sulphide in the surface of the steel will be attacked and decomposed, and the resulting minute streams of sulphuretted hydrogen gas issuing from these particles will act upon the silver bromide on the paper and produce dark specks of silver sulphide opposite each particle of sulphide in the steel surface. A direct contact print may thus be obtained which will plainly indicate the distribution of sulphur in the sample of steel. Other impurities present in steel usually occur in the same localities as the sulphur. Consequently a "sulphur print" will serve as a guide not only to the distribution of sulphur but also to the distribution of other impurities present.—Amateur Photographer.

Sensitized Silk. A few years ago a boom in sensitized fabrics threatened. The idea did not catch on; it is essentially amateur, but occasional inquiries are still heard. Cotton or silk may be sensitized as follows: Prepare ammonium chloride, 100 grains; Iceland moss, 30 grains; boiling water, 10 ounces.

When nearly cold, filter, and soak the fabric in it for fifteen to twenty minutes. Dry, and then soak for fifteen minutes in a silver nitrate solution, 20 grains to the ounce, just rendered acid with nitric acid. Dry in a dark room, and overprint. Tone and fix as usual.

SKYLIGHTS

By FELIX RAYMER

N an experience extending over years, I have not found two operators that had identically the same style skylights to work. There is always a difference, although it may be very slight. The lights may be the same with the exception that one is longer from the point where it joins the side light up to its highest point. While this difference may not be over two or three feet, it will make a vast difference in the method for working the lights. It is often the case that an operator does not give the size of his light the proper consideration; and yet the size, and its relation to the size of the operating room means much. In fact, good work depends upon the understanding the operator has of the capacity of his light and operating room. There should, if possible, be harmonious relation between the room and the light. But unfortunately this is not always possible in having the light built into the room. However, I make the assertion most emphatically that this harmonious relation can be brought about by the operator.

First, the operator must understand that to have a large light, and to work that light to its full capacity, he must have a large operating room. And just here I will say that the mistake is often made by operators, in insisting on having a large light, when the room is small. The reason for this insistence, so far as I am able to ascertain, is based upon the belief, that the large light makes it possible to shorten the exposures. This, however, is a serious mistake, if the large light is handled as it should be and the small light as it should be. For example, we will suppose we have a light measuring fourteen feet wide, and that the top light extends upward on an angle of 45 degrees from the side light, fourteen feet, it would be necessary, if we wanted to use the light at its full capacity, to place the subject at least fourteen feet out in the room, from the side light. Is your room wide enough to

do this? If so you are specially blessed, for this would require a room of not less than eighteen feet in width, as there will be a certain amount of space necessary for the adjustment of the reflector, and ground, and also for the purpose of moving the camera around on the shadow side of the figure, if a Rembrandt effect of lighting is to be made. I understand fully that a head screen may be used to screen off part of the top light, and so can curtains be used on the light for that purpose, but in either case it would not be working the light at its full capacity, for there would be a certain amount of it closed off by the use of either screen or curtains. If any of it has to be closed off. what could be the use in having it made so large? Why not have had it made the correct size for the room, and thus have done away with the necessity for curtains or screens. We, of course, know that in the majority of cases, the photographer had to accept the building in which he had his studio as it was first built; but there is no need for him to place a larger light in the room than the room will accommodate. But if the light is there and it is his desire to secure the best work from it, he should have opaque curtains placed on it so that he can reduce its size to conform to the size of his room.

The subject should be posed at a certain distance from every light, and that distance is determined by the size of the light. The larger the light, the farther from it the subject should be stationed. This is necessary for the reason that there is no time in the making of portrait work when there should be light falling all around the subject, as would be the case if the subject was not stationed out in the room at least as far as the light measures in height. If the light should be fourteen feet high and the subject stationed say ten feet from the side light wall it can easily be seen that there would be four feet of light falling over on the shadow side of the face. This should

never be. There should be light falling on *one* side of the face, but grading across to the other side, until it falls off in shadow as deep as it can be made without losing the flesh tints. So we arrive at the conclusion, if the room is fifteen feet wide, the light should never be larger than just enough to permit of placing the subject away from it the required distance for its size. In other words, for a room fifteen feet wide, the light should be smaller than for a room twenty feet in width. The same is true of the room twelve feet wide, and so on.

I will suggest that the subject should be placed directly under the highest edge of the top light. Then look into the shadows, and especially the shadow from the nose. If it runs directly under the nose, the subject should be moved away from the light still farther, or the shadow extends outward toward the corner of the mouth. If the room is too narrow to allow of moving the subject away far enough, there is but one other thing possible, and that is: To close off the top part of the light with opaque curtains until the shadow from the nose does run out to the corner of the mouth.

Now, what effect does this method of working the light have on the exposure? My experience is that it does not prolong the exposure a particle. The reason for this lies in the fact that the smaller the light the nearer to it the subject is stationed, and of course the nearer to it, the stronger it falls on the subject. If we were to take one

light, and use it at the same size always, but station the subject at varying distances from it, we would find a vast difference in the exposure. But if one distributes the light over the face correctly for an artistic piece of work, one light will work as rapidly as another. This is provided of course that both lights are of the same glass, such as ground glass, clear glass and so on. I make sittings by a window measuring four feet wide, almost every day, and my exposures are identically the same as given under my large double slant light which measures sixteen feet wide, and sixteen feet high, measuring from where it joins with the side light. In the use of the window the subject is about four feet from it, while in the use of the large light the subject is at least sixteen feet from it. I have amble room to work away from my light as my room is forty feet wide.

Certainly I understand that the subject may be stationed nearer the larger light and the effect of the light controlled with screens or curtains, and in my instructions, it is often done, for this instructs one in the use of screens and curtains so that if they are ever needed they will not be more confusing than beneficial. But for all practical work in a regularly conducted operating room I cannot see the advisability of inviting the light into the room and then shutting it out, so to speak, except for the purpose of concentration and accentuation—but that is another story, and one to

be handled in a later article.

Straightening Prints. When prints are taken from wash water blot off the surface moisture and lay out on sheets of waxed paper to dry—in a slight draught if possible. In general, they dry without curling very badly.

Have three clean blotters, a little larger than the prints, and have them dampened evenly—usually those that were used for a few minutes—when they will be right—place two prints alternately with three blotters under a heavy sheet of glass for a few minutes—when they will be found to be per-

fectly flat, and the dampness almost

imperceptible.

Place instantly between clean dry blotters and stack under good pressure; in a short time they will be dry and smooth. The knack consists in employing just as little moisture as possible to straighten the prints, so that they will dry again at once.

By this method all rough handling that might cause damage is avoided.

All papers can be treated in this way, platinum requiring surprisingly little moisture, but collodion somewhat more.

LANTERN SLIDE MAKING

By H. R. NEWTON

The Development of Lantern Slides for Black and for Warm Tones

DEVELOPMENT of a lantern plate is closely similar to that of a negative: the only essential difference being that in the case of the lantern slide it is important to have an image of a color that is pleasant to the eye, at least when it is projected by the lantern, and that it is also important to have a perfectly clear image. A slight fog over a negative only means that a little longer exposure must be given during the printing whereas in the case of a slide it would mean that the whole image was darkened over.

For these reasons it is customary to use a different developer for lantern slides than for negatives, one which is designed to give results of this character: but there is no other necessity for so doing, and if the developer that is used for negatives will give perfectly clear images of a suitable color, there is no reason why it should not be used. Formulæ suitable for the plates employed are given by their makers, and unless the worker knows of some other that can be relied on to give good results, he will do well to use one of these.

For black tones hydrokinone, metol, or amidol is very suitable. Lantern slide making is work that is often undertaken in winter time: so it may be useful to point out that no developer works well in a very cold solution, and hydrokinone in particular is affected by low temperature. The developer, water, and dishes should therefore have been in a properly warmed room for an hour or two at least before use.

The correct degree of density in the slide is ascertained by watching the process of development and stopping it at the right point. It is much easier to determine this point in the case of a lantern slide than it is when a negative is being developed, because the comparatively low sensitiveness of the lantern plate allows so much more light to

be used in the dark-room. Lantern plates are also much more transparent than the plates made for negative work, and the image is therefore very plainly visible during development, and can be seen from the back as well as from the front soon after the action has begun.

Although almost all lantern slide workers decide when to stop development by looking at the lantern slide itself, it is a great help, especially for the beginner, if a note is made of the time required to give the correct degree of density. For the note to be of any use a fresh lot of developer must be taken for each slide, as the development of one plate in the solution, even if a good bulk were used, has a considerable (but not a regular and calculable) effect upon the rapidity with which it will act on a second plate.

A good plan for the novice is, after finding by a series of trials what is the correct exposure, to give three plates that exposure exactly, and then to develop all three in the same dish. note should be made of the time when the developer is poured on, and the first should be taken out and fixed at the earliest moment at which the photographer thinks it can be sufficiently dense. It is almost certain that it will be much under-developed. The other two plates should be developed respectively for half as long again and for twice as long: a note being taken of the time which elapsed before each was taken out. When these are subsequently tested in the lantern, and in that way it is found which is nearest what is required, the note of the time during which it was in the developer will be found very helpful.

Lantern plates can be developed in a quarter-plate or in a lantern size dish: the quarter-plate is the more convenient, as the extra length makes it easy to pick up the plate from time to time. A shallow porcelain dish is what the writer prefers for the purpose. At first a couple of ounces of developer should

be used for each plate, as with this quantity one can be certain that the whole of the plate is covered at once: but the expert worker would not require more than an ounce.

As soon as development is judged to be complete the slide should be quickly washed and then slipped into the fixing bath. With many developers a wash between development and fixing is not a necessity, though, if it is not too prolonged, it can at least do no harm: but with solutions containing hydrokinone, whether by itself or in conjunction with metol, this washing should on no account be omitted. If it is, there is a great likelihood of a yellow stain making its appearance in the film, which will completely spoil the slide and of which there is no means of getting rid.

An acid fixing bath should always be used for lantern plates. It is important to keep the slide as transparent and as free from stain as it can possibly be made: and an acid fixing bath is a valuable precaution. There are various formulæ for the purpose; a simple one consists of ten ounces of a solution of hypo of a strength of two ounces to the pint, to which half an ounce of sulphurous acid, in the dilute form in which its solution is stocked by druggists, is added. In place of the sulphurous acid, fifty grains of potassium metabisulphite may be used; or some of an acidified solution of sodium sulphite, formulæ for which are to be found in the text-books. In this case, it is important on no account to exceed the quantity of acid that the formula gives: no harm results from the use of a little less, but a little more may affect the permanence of the slide. Using less than the specified quantity of sulphite, in proportion to the acid, is, of course, as injurious as using too much acid.

Lantern plates, as a general thing, fix much more quickly than negatives. Some kinds lose all visible cloudiness in a minute or less. Complete fixing is as important with lantern slides as it is with negatives, and the time required is found in the same way. That is to say the visible action of the hypo solution is watched, and the slide is left in the bath for at least twice as long as it takes

for all signs of the cloudiness to vanish. If it is left for four or even six times as long, no harm will be done.

After fixing the slide is washed to get rid of all trace of the by-products of fixing, which can be done in the same way as with a negative. Before putting up the finished slide to dry, it is necessary to hold it under the tap or under the surface of some clean water in a basin, and then to rub the surface of the film gently with a tuft of absorbent cotton. This will remove a deposit of salts of lime often left on the film when the water used is hard. The slide must be dried out of reach of dust, and is then ready for masking and binding up.

The foregoing procedure is that which is followed when slides of a pure black color are required, either to be shown as they are, or for subsequent toning. It is best for the beginner to start with slides of this kind, as their production is easier than that of slides which are of warm tones produced by direct development: but almost all the leading lantern slide workers adopt the latter process, at any rate for the majority of their slides. It requires the use of special "warm tone" lantern plates, which are much slower than those made for giving black tones only: and the warm color is then obtained by giving a much longer exposure than is needed for black tones, and developing in a solution which is strongly restrained with bromide, and which usually contains some ammonium carbonate also.

For warm tones no better developer than pyro can be employed: and as different degrees of warmth require corresponding differences in the composition of the developer to bring them out, it is most convenient to keep the developer in the form of 10 per cent. solutions. Four of these will be required. of pyro, ammonium bromide, ammonium carbonate, and of liquor ammonia respectively. The pyro may be the 10 per cent. solution used for negative work, provided there is sufficient preservative present to prevent stain. A good form is made by crushing fifty grains of potassium metabisulphite and dissolving it in five or six ounces of water which has been boiled briskly and then

allowed to go cool undisturbed. An ounce of pyro is then dissolved, and further boiled water added to make ten fluidounces in all.

An ounce of ammonium bromide is dissolved in seven or eight ounces of water and diluted to make ten ounces in the same way; and a fluidounce of strong ammonia is diluted to make ten ounces The ammonium carbonate, it is important, should be in the form of waxy lumps, with little or no adherent powder. If there is only a little powder on it, it may be removed by rinsing the lumps in cold water before dissolving them; but if the powdery character extends any distance into the mass, the salt should be rejected. It only dissolves slowly, so it should be put in seven or eight ounces of water a day or two before it is required, and then diluted to make ten ounces like the rest. None of these, it may be pointed out, are, in the strict sense, "10 per cent. solutions," but they are quite near enough for all practical purposes.

With these four stock solutions we can ring the changes in the way of color within very wide limits; but to avoid wasted plates and wasted time, it is best to determine on some particular combination of the ingredients, and to keep to that until it can be used with certainty. A good proportion for a start may be obtained by taking twenty minims of pyro solution, thirty minims of carbonate, and fifty minims of bromide, diluting the mixture to make two ounces. Immediately before pouring it on the plate, thirty minims of the stock solution of ammonia should be added to it. These proportions will be found to give a very fine warm brown color with an exposure three or four times as long as that which would be required for black tones on the same class

of plate.

There is only one way to find out the exposure which is required by any particular developer, and that is by actual trial. At least three different exposures may be given on the same plate by screening part of it in the way already described, and in this way the exact time to give the best result may be found.

In the case of these modified developers for warm tones, it should be observed that there is no power of compensating for errors in exposure by developing for a longer or shorter time. So long as the temperature is fairly constant, there is a definite time which each developer must be allowed to act to give the color for which it is designed: and when that time has been found, then the exposure must be adjusted so that when the plate is developed for that time the finished slide has the correct density. If it is too dense, it is not a sign that it has been developed too long, but that the exposure was too long: if it is too thin, it is a sign that more exposure was required. The point is one on which emphasis must be laid, as in it lies the whole secret of the successful production of good colors by this method, if it can be called a secret.

Timing development is a great help in the case of warm tone work, as it is difficult to judge the density without a good deal of practice. When a lantern plate is developed to give a plain black image, the density of the finished slide is not very different from that seen in the plate before it is fixed: or, at any rate, it is not difficult to allow for the change which takes place in the fixing bath; but with warm colors there is a much greater loss of vigor, and the warmer the color the greater the loss.

Before leaving the subject of the development of lantern slides, it should be observed that, although with practice it is possible to tell with fair accuracy what the slide will look like when it is projected, the only absolutely reliable test is to see it on the screen. This applies particularly to slides of a warm tone, especially those in which the image, when seen by reflected light, is of a light color: but it is true more or less of all. It is for this reason that, in all lantern slide competitions of any standing, the slides are judged by being shown on the screen.

The foregoing operations, if all has gone as it should, will give a transparency which, placed film downward on a sheet of white paper, will look, as far as its unexposed edges are concerned, as free from deposit as clear glass itself;

while, unless the image is very light in color, it will appear as a little too heavy for a good positive print. In the picture itself there should be no areas without deposit at all: but the tiniest spots of the highest lights of all should hardly be perceptibly tinted.

Masking, Binding, and Spotting Lantern Slides

Strictly photographic operations cease when the lantern slide has been developed, fixed, washed, and dried; unless it is to be toned. But before the slide is ready to be shown in the lantern, it must be protected from injury; the picture must be masked, which is equivalent to the trimming of a print, and it must be marked in such a way that the lanternist may know at a glance how to put it in the lantern. The first of these processes is the masking.

Lantern slides which are mere diagrams, that is to say, those in which there is no attempt whatever to obtain a pictorial result, need little in the way of a mask. The area of good definition given by a lens is a circular one, and for such slides we can buy ready-cut circular masks which do what is wanted with a minimum of trouble. These masks are pieces of opaque paper, $3\frac{1}{4} \times 3\frac{1}{4}$ in., with a round opening about three inches in diameter, or maybe a little smaller. One of these is placed on the film side of the lantern slide, the cover glass is put on and the two bound up together with the mask between them.

Such masking is quite out of the question in lantern slides for competition, except in a "scientific" class. No matter how little the photographer may regard himself as a "pictorial" worker—and his work may be all the more truly pictorial if he is not too conscious of deliberate artistic strivings—with all other classes of subjects, the mask should be definitely selected of a size and form to display the picture at its best. It may happen in a few cases that a circular mask is the most suitable, still more rarely an oval mask may be what is wanted, but in the vast majority of portraits, architectural subjects,

landscapes, still life, animal pictures, and all the varieties which engage the attention of the amateur, the best possible mask, one might almost say the only permissible one, is the simple rectangular opening with straight sides and clean-cut corners. Just as when making prints we trim them with four straight cuts, so in making lantern slides we mask them in the same simple manner.

Masks with such openings can be bought all ready cut; but it is much better not to attempt to use them, since unless a very wide range of sizes is at hand from which to choose, the photographer almost inevitably allows his decision, as to what to admit and what to exclude, to be influenced by the mask he happens to have. Besides, it is an extremely simple matter to build up a mask to any required size by means of four strips of paper, and this is what most slide makers do.

Opaque paper, usually black, can be bought in strips and gummed on one side, under the name of lantern slide binding strips. The slide maker will get a supply of these in any case for binding his slides, and he can use them for masking as well. But any opaque paper will do; and in the black paper used with roll film and in film-packs we have an excellent masking material. If we cut some pieces into strips an inch wide or less, using a guide and a sharp knife, or a guillotine cutter, just as in trimming a print, so as to get each of the strips with one clean straight edge, we have all we shall want.

To mask the slide it is placed, film upward, on a sheet of white paper, so that the picture on it can be clearly seen. One of the strips is then taken, touched with gum in a couple of places, so that when put down on the film of the slide it will adhere, and is then placed at once in such a position that it covers all the lower part of the slide up to what is to form the baseline of the picture, the straight edge of the strip being put to form that boundary. The strip will perhaps extend beyond the glass at both sides and along the bottom, but that does not matter for the present. The top edge of the picture is then masked off in exactly the same way, taking care, of course, that the edge of the strip is exactly parallel with the opposite edge of the first strip. The two sides are next dealt with in a similar manner, and the slide left for a little while until the adhesive has become dry, which it will do very rapidly, since the gelatin of the film absorbs the moisture from it almost directly. It is then turned over upon a smooth card or similar surface, and the superfluous parts of the strip all round are cut off with a sharp knife.

The method of masking described in the previous paragraph is actually easier for the beginner than masking with binding strips, which are a little apt to get curved or twisted in putting down, and which once in contact with the film are only shifted with great difficulty. The strip should be cut into lengths a trifle greater than the width of the slide, moistened until quite limp. and then, holding them by the two ends, they are brought down into the required position and rubbed into contact. one strip is not wide enough to extend to the edge of the slide, a second can be put down in the same way, slightly overlapping the first. Any excess is

cut off as before. Whichever method may be adopted, it is necessary before actually applying the mask to decide how much of the picture is to be included. The considerations here are exactly the same in every way as they are in trimming a print: and if, as is most likely, the picture on the slide has already been dealt with in print form, the decision as to the best trimming has already been reached. Some workers find it helpful to rule pencil lines on the slide, to indicate the boundaries of the picture, the lines being so placed that they are just covered by the masking strips. This is certainly a help if there is any difficulty in securing perfect parallelism of the strips; but a worker with a "straight eye" will not require it. Another device sometimes used is to rule on a strip of card with all the accuracy possible a number of parallel lines an eighth of an inch or less apart. Against the first of them is stuck a strip of card with a perfectly straight edge, coinciding with the line. The slide is then placed on the card and pushed up until its edge is stopped by the edge of the strip, and while in that position is masked, being turned round as each strip is laid down. The ruled lines are clearly visible through the slide.

After masking comes the binding. Cover glasses for slides can be bought: but, unless the worker is very easily satisfied with his results, he will have enough comparative failures among his slides to provide all the cover glasses he will need. The spoiled lantern plates should be left to soak overnight in cold water, and then placed in very hot for a few moments, picked out, and given a good brush over with a stiff nail When apparently clean they brush. can be slipped into another basin of hot water until all are dealt with. The brush should then be well washed to get rid of any gelatin, and the glasses scrubbed over with it again, this time using some soap: and after a rinse or two to get rid of the soap, they can be put up to drain and dry. Any slight marks left by the water can be got rid of by a final polish.

Before binding up the slide, one should make quite sure that it is perfectly dry: it is a good plan to hold it in front of the fire until it is hot, and then to bind Taking care no dust is included, the cover glass is placed down upon the masked surface and the two are bound together with gummed strips. slide makers bind all four sides at once, with a single strip: but the writer prefers to bind two opposite sides and then the other two. Binding strips can be bought of different colors, and either in $3\frac{1}{4}$ in. pieces or in lengths: the lengths are more generally useful to the amateur photographer, as such strips can be used for a

variety of purposes.

The strip is moistened and put gummed side upward on a smooth surface. It will be found that strips adhere much better to the glass if the gum on them is moistened with a little paste or photographic mountant than if water is used. The strip must be perfectly limp, and then the slide and cover glass being held together, one edge of the two is brought down exactly on the center of the strip, pressed firmly down on it, and then raised, bringing the strip with it. The slide is then turned so that the opposite edge is on the table, and the strip pressed into place by stroking it downward on both sides of the glass at once with the fingers. The opposite edge of the slide can be bound in the same way, and it is then put on one side for a few minutes. When the adhesive is dry, the projecting ends of the strips, if any, are cut off with the scissors, and the other two edges bound. It only remains to spot the slide and clean the glass, when it is finished and ready for display.

As the actual quality of a lantern slide can only be seen when it is in the lantern, it is a good plan to give it a temporary mask and to attach a cover glass with a couple of pieces of paper, and then to project it. If it is found to be what is wanted, masking and binding can be carried out as described. It is rather fiddling work to mount up a slide neatly, and the labor may therefore be saved until one knows that it is not to be wasted.

A lantern slide being square, there are eight different positions in which it can be put into the lantern, and seven of these are wrong. The lanternist has to work in a very feeble light, and so it is important to give him a clear and unmistakable indication of the correct

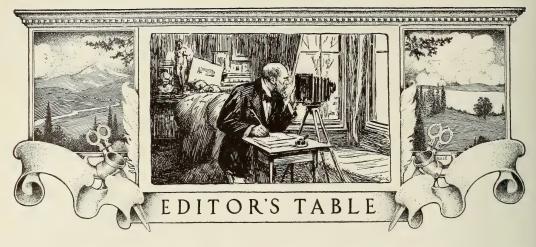
way, and this by general agreement now, as far as this country is concerned, is by "spotting." Two spots, usually white so as to show up plainly against the dark color of the paper used to mask the slide, are stuck on at the corners, these corners being those which are to be downward when the slide is put into the lanterm and the side of the slide which bears the spots is to be turned toward the condenser of the lantern. To recognize the corners to which the spots are to be applied, all we have to do is to hold the slide so that on looking through it we see the picture the right way up and the right way round, just as it is to appear on the screen. spots should then be at the two top corners on the side turned toward the eves.

White discs of paper for spotting slides can be bought, but they are easily made with a paper punch, such as is now found in most offices, where it is used for filing purposes; or they may be cut with scissors, although it is difficult then to get them to look very neat. Careful workers put the spots on before applying the cover glass, as then there is no risk of them getting rubbed off when the slide is cleaned. The spots should be small ones, or they may sometimes have to be cut down to prevent them from encroaching upon the picture.

(To be Concluded)

Making Solutions. In making up photographic solutions dissolve the ingredients in the order named in the formula. When using dried sodium sulphite stir the water as you drop the chemical into it. If not, the soda is likely to harden and needs very vigorous shaking to dissolve it. If the water is kept in active motion when chemicals are added they dissolve more readily and there is not likely to be any sediment at the bottom.

Retouching Fluid. You can make a good retouching fluid by mixing 30 grains of powdered rosin with 1 ounce of oil of turpentine. Apply to the places to be retouched by dipping a wad of absorbent cotton in the liquid and dabbing the negative gently. Let the plate stand for half a day to dry. If not much retouching is to be done to the plate use powdered pumicestone to rub over the places. This will roughen the film enough to make a good "tooth" for the pencil.



STIMULATING THE PHOTO-GRAPHIC HABIT

NHERE seems to be developing in this country a tendency on the part of the public to limit the seasons during which they give any attention to the important matter of photographic sittings. This subject is important, not only from the view-point of the photographer, who is dependent upon it for his living, but of extreme importance to the public itself, who do not seem to realize the necessity of frequently visiting the studio for the purpose of securing for their children and their children's children such photographic records as alone will serve to show those coming after them of what nature of man or woman he or she was. How often does it not happen that death or accident comes unannounced, removing some member of a family who, when search is made, is found to have left behind no portrait at all, or one so old as not to be a likeness to those familiar with his features in the later years? The keen regret that follows such neglect is known only to two classes of people, the friends that are left behind to mourn the loved one and the photographer who is almost every day brought face to face with the impossibility of doing justice to the subject by enlarging some old-time faded print or scratched and battered tintype. Time was when such omission to leave behind a recent portrait was excusable on the part of many. The

cost and difficulty that confronted our fathers and mothers has, however, been made almost *nil*, and when we stop to think how much real pleasure the average man or woman receives when the postman delivers the dozen or more prints from the photographic studio, it seems almost unaccountable that the sittings are not repeated and re-repeated with far greater frequency than they are.

In many communities it is coming to be a rule that the photographer may safely count upon a fair share of trade just before the Christmas holidays, and again for a few weeks in the early spring.

In some of these communities, however, he may as well close up his place the balance of the year so far as any profit is concerned. He may, at most, pay part of his expenses, but scarcely more. There was a time, as some of us remember, when an average of thirty sittings a day was considered good. Now an average of three a day is doing very well. The fault in most such cases may be rightly laid at the photographer's own door. He has failed to keep his constituency keyed up to the thought that photography has no "seasons" that it is one of the prime essentials in a community of intelligent men and women that they should be inoculated with the "photographic habit." This habit should be cultivated and indulged in at all seasons of the year. Teach your public to feel and to believe that when its young or middle-aged man feels himself in fittest trim, his health and

spirits good, and all that's best within him seems bound to assert itself in every pose and feature, it is then that he should sit for a portrait. Impress upon the public mind the thought that the sitting for a photograph is but the veriest pleasure to the sitter. It is the photographer only who has any right to feel that the skylight is an operating-room. Make it clear to the young mothers of families and to the elder matrons that with the rapid and subtle changes of childhood and youth many of the most delightful phases of the boys' and girls' lives are totally and hopelessly lost, even to memory, unless perpetuated by photographic record while they exist.

Instead of tacitly accepting the conditions as they seem to exist, each year shortening the two, already too short, photographic seasons, combat earnestly, unceasingly, and believingly the idea that any limitation should be put upon the time of year or season for being

photographed.

The thinking photographer who puts his conscience into his work has a right to feel that he is doing a lasting service to every man, woman, and child sitting before his camera. He is giving to them, in his finished work, a portion of himself. He is making for them, and of them, pictorial records for posterity to study, and into these records he is crowding as much or as little as he may of the really beautiful and good in the These attributes are not worn lightly on the sleeve of man or woman, they must be drawn from the inner consciousness of the sitter by the masterly skill and ability of the man behind the camera. The man who has this skill, and who, possessing it, puts it at the service of his sitters, has a right to expect and should claim their support.

Such a man should, and, fortunately, a few of them do, realize that in keeping himself constantly in the mind of the public he is rendering it a service for which its well-earned dollars no more

than pay.

What more sacred and delightful mission can be conceived than that which lies within the grasp of him endowed with the peculiar power of photographing children? A man so gifted owes it

to the world that it should know of him. He places in the mother's hands those tangible, pictorial records of her dearest jewels, that without his aid would ever be but dim and dimmergrowing memories, dear to herself but not to be enjoyed or shared with others in all time to come.

Such men should force their work, if need be, on the public mind. They should assert their right to live and to live profitably by the exercise of their peculiar skill in the production of that for which in every community of any size there ought always to be found an

ever-increasing demand.

If the photographer will strengthen himself with this thought and with the realization that he has a mission to perform he will find himself met half way. Having demonstrated his ability to perform, he must, however, modestly, but earnestly and forcibly, make his public aware of his presence and familiar with his name. He must have publicity. When he has found the proper channels he will discover that there are no "seasons" in his studio. There will be times when, for one reason or another, he will be more than usually crowded with orders. but the long weeks and months of "fallow season" that now characterize so many studios will not trouble him. Publicity of one kind or another is the bridge upon which he will cross the gulf that separates him from a better prosperity. There are many methods of publicity. Which will he adopt for the abolishment of this limitation of "seasons" in photography?

COÖPERATIVE TRADE FINISHING

WE have had occasion to allude to the unusual efficiency and new methods of coöperation and centralization in the Photographic Division of the Signal Corps at Washington and to point out how the war has necessitated these new methods and systems here and abroad, some of which are sure to be applied later in this country, and will affect all classes of photographic workers. Already we hear

talk of preparedness for the trade conflicts of peace. Peace may or may not come this year. No one can tell, and prophecy has no place in the shifting conditions of the war. But indications at present are decidedly toward greater efficiency, economy and coöperation in all lines of photographic production

where practicable.

In England, where trade conditions, as we know, differ from those here, there are, nevertheless, some valuable ideas and methods being practised which we can learn and perchance apply. The announcement has just been made of a new project of a cooperative society to manufacture photographic plates and paper, and the promoters lay emphasis on the benefits which may follow the cooperative system of trading. Just how this plan will work out, especially under war conditions, is difficult for us to predict, but it will be interesting and profitable to observe the results of the experiment.

There has been, however, a successful demonstration of cooperative work in one important branch of the trade—the finishing business. We commend to the special attention of our readers the interesting article published elsewhere in this number, describing completely the business organization and methods of handling the finishing business for the trade by B. Matthews, of Bradford, England. This article, "Brains in Business," should be read by everyone interested in trade finishing.

Similar organizations stationed in sections of the United States might be feasible here, and lead to much relief in solving the problems of the photographer, especially in the commercial trade.

This method of efficient cooperation, it seems to us, is worthy of careful thought and consideration.

PRICES AND QUALITY

"S MALL profits and quick returns" may help to run a grocery or a dry-goods store, but it is scarcely the motto to tack over the entrance

to a studio. A photographic business must depend too much on the personal equation of its head; and cannot be enlarged by the creation of departments or increasing of the number of clerks. There is ever a tendency to think of the evil of price-cutting whenever competition is unduly keen or prices unduly bad. But the stress of this unfair fighting inevitably results in a poorer grade of work.

Let any enterprising, talented, incoming young photographer take the pains to instruct himself in the business methods of those photographers who have come out best, both financially and in reputation, after a twenty-five or thirty years' career in the business, and see whether the successful men have been the cheap men. We think he will find that those who are best off are the ones whose aim it has been to produce good work, work such as they might always feel did them credit, and who adhered strictly to fair prices—prices which remunerated them in a fair way for the labor and talent which they

bestowed upon their work.

Any sensible individual, if he stops to reason, will see that it is a mean spirit of rivalry, which can only end in shortlived success, to plant yourself beside an honest, well-established photographer, either in city or country town, and, by cutting prices, rob him of a share of his well-earned business. If you continue, you ruin the profits for both. If you, after a time, remove, to repeat your game in a new location, what have you gained? Surely, nothing in reputation, and the expenses of bandying about will soon have eaten up your miserable, scanty profits. If it becomes necessary to locate yourself in the vicinity of others of your craft—honest, good price men, or cheap men let them be-keep your prices up, and let your competition with them be in the excellence of the work. Instead of doing cheaper work than they do, do better work. Let the competition be a best man competition, and, if you crowd out your rival, it will then be simply carrying out one of nature's infallible laws, namely, the survival of the fittest.



PRACTICAL PAPERS ON STUDIO WORK AND METHODS

The Window Display

Why do so many photographers neglect their show windows? During a recent trip covering half-a-dozen small towns between New York and Albany I observed, with no little surprise, that the local photographers in every town visited were altogether unappreciative of the value of their display windows. To be sure, the small town is a dull place in February; but this could not excuse the lack of enterprise exhibited, nor the disordered windows, which impressed one unfavorably in passing

their places of business.

It is about time the small town photographer realized that he is behind the age in this detail. The photographer fortunate enough to possess a window of any size fronting on a public street has a means of advertising his business which can hardly be overestimated. By his window he can daily remind his townspeople and visitors of the facilities of the studio, introduce specialties and educate his public to realize how useful photography is in the daily life of the community. In a town with 5000 inhabitants a display window upon a good thoroughfare should be worth fully one hundred dollars a year as advertising space. I hope to awaken one or two, here and there, to this

neglected opportunity.

In New York and all the larger towns, the greater amount of "life" in the streets, and the high rentals demanded for space along the principal thoroughfares, compel the photographer to think how he can best utilize all the space he has for advertising his business. At times this leads to overcrowding in the display window, but, as a rule, the city photographer's window is well arranged to attract the attention of the public. Human nature is the same everywhere, and what is done profitably among a thousand people in one place will prove proportionately profitable among a hundred people in another place. Let me persuade the photographer to try the value of his window space as a business "puller-in" for 1918.

There are so many ways of "dressing" a

photographer's window to make it profitable that I hardly know where to begin with suggestions. We will suppose that the month or season of the year is adopted as a motif. March is the month when spring costumes are made and bought, and spring dresses photograph to advantage when new. Why not "dress" the window with an attractive display of portraits of fair women and children in all the glory of spring finery? Your negative stock will supply the specimen prints. The idea could be emphasized by securing a model and the cooperation of the local modiste or milliner to make up a set of twelve pictures showing the new spring styles. Announce such a display in the local paper and your window will draw every woman in the township. For such a display the ground on which the pictures are set should be light, but not glaring in color. Light grays and fawns are the season's most fashionable colors; run your display ground and mounts to harmonize with the suggestion, and the window will be all the more attractive.

Let us take another suggestion. Spring time is a capital time for the introduction of new styles. Among the excuses oftenest offered for neglecting the display window is the one that cabinet pictures are difficult to display because of the monotony of size in arrangement. Why not show a selection of new styles in which the regular cabinet portrait loses its familiar shape and appearance? The simple departure from the "rut" of custom will attract the curious. Make a display of portraits trimmed in odd sizes and shapes and mounted with liberal margins. Show prints in different colors, and educate your public in the variety of effects obtained with this or that color in mounts or finish. There is room, in such a display, for calling attention to a distinctive style at a higher price than the regular cabinet can bring.

We will suppose that the photographer desires to encourage his business in children's pictures. Why not make a good window display to start the idea working for you? Every gallery should make a show of children's pictures at least once a year, and advertise it in the papers.

March is not only the month of "fashions," it is also the month of the "spring cleaning" in every well-conducted household. This means that the home is being brightened up for the light summer days. No better opportunity could be desired for a window display of new designs in picture-frames. For the "ground" use a warm maroon canvas, show a good selection of gilt and light wood frames of various sizes, and in the center of the display place an old time-worn enlargement framed years ago, to show the contrast between old styles and new. The display of dainty frames gives an exceptional chance to show your best portrait work to advantage.

The objection may be made that these suggestions involve labor or expense. How can the photographer attract attention to his window with only a frame or two of ordinary work to

show?

Finally—it should have been said first—see that the window-frames and outside furnishings have a coat of paint, and that the windows are cleaned and polished every day. The dingy and ill-kept appearance of the outside of the average country gallery is, of itself, enough to discourage anyone from approaching the place except when some special interest makes it necessary. Paint is cheap, and it helps wonderfully. Enterprise costs a little more than paint—but it also pays better. Apply a little of both to your window display this spring, and the effect will surprise you.—John A. Tennant.

Children

It is not only interesting but oftentimes very amusing to see how different photographers handle the children that come into their studios and the results which they secure. We have pictures of our children, now grown, taken by a photographer when they were little, which money could never buy. This photographer knew just how to take the children, how to amuse them, and how to get the best possible results. To him it was not an unpleasant task or a trying duty, but a pleasure. Judging by the pictures which some photographers exhibit in their show cases they have only one method and that is of frightening the child until it remains perfectly still long enough to get the exposure, and the picture they exhibit is that of the frightened child. To get photographs of children in their natural positions and attitude, with their natural expression, oftentimes means patience, but the result has always paid the photographer in dollars and cents. Of course, oftentimes, mothers and relatives have an idea how they want the photograph and hinder rather than help the photographer. The photographer of children must exercise skill and use judgment at all times. An impatient gesture or look will be reflected on the child's face and show on the picture; furthermore, this often excites the parent and things go from bad to worse. It is not every child that you can become friendly with at once, but if you persist you will soon succeed, and the result in many cases will well repay you for the time spent. Try to ascertain, if possible, the boy or girl's special pleasure or

the things in which they are especially interested, and talk to them on those subjects. Do not attempt to make ideal pictures or studied poses; just get the child as it is and you will please the parents. You can hurry older persons through sittings, rush them along, and get fairly good results, but with children you must always take plenty of time. You should know best how to photograph the child, and if the mother insists on some other lighting or position, make a negative her way, then make several your way; show the proofs, say nothing, and you will get the orders.—Ohio Photo News.

Reception-Room Sample Pictures

Where trade is slack every method of making things look well and good and bright should be employed; on the other hand, the ever-busy reception-room should be equipped with every possible means of saving time and every method of increasing possible orders. The display of portraits on the walls should be constantly changed and kept up to date, and although, naturally, at present military portraits will largely prevail, the fact that other people still want photographs should not be overlooked.

But it is with the "working samples," call them, that I want to deal with specially now; and although so much has been written about these, and certainly during the last few years better methods of keeping and showing them have come into use, yet the matter is one of such vital importance that any means of bettering things in this respect should be at least considered. We, as professionals, are so apt to regard things from only our own point of view instead of from the point of view of the customer, that unless we force ourselves to it we cannot get into the habit of seeing things from the customer's view-point. In this connection it should be remembered that although we can quite well see in our mind's eye the difference between certain processes and styles, and can from one print-say of a man-conclude what a portrait of a child will look like if it be printed in the same process, yet we cannot reasonably expect customers to do this, and therefore our "working samples" should include not only as many different processes as we work, but as many different subjects as we usually find form the bulk of our business. Another point of the greatest importance is to see that the various styles of portrait are kept quite distinct, so that, for instance, when showing a customer some portraits made at fifteen dollars per dozen, a sample of some cheaper style does not turn up just when the customer is deciding what kind to order, or the chances are that the cheaper style may be decided upon.

The various sample display cabinets and stands on the market have all been designed with this end in view, and are excellent for their purpose, but where there is an objection to their use some well-designed scheme must be adopted to achieve the same end. The plan of keeping the samples in separate piles on a table, or in special little portfolios, is that which is generally adopted, and although this is better than letting them lie about the room, it has

many drawbacks. This method which I adopted until recently works admirably, if the portfolios are kept in perfect order—that is, out of the way, in drawers except when in use—but during a busy time the receptionist, however careful, is apt to leave one of them upon a table so that a customer may see it before he should do so. Also, continual handling will soon soil the light mounts and prints and make them look dirty, and so detract from their selling properties.

To overcome these difficulties I have recently adopted another plan, which seems to answer all its purposes well. Sample booklets of every different style of portraits made at the studio have been made, one booklet for each style, and these each contain a representative collection of work in each style. Six full sheets of a suitable dark gray art mounting paper are taken and folded in half, thus making a booklet which will take twenty-two different prints face to face. Left in its original size, such a booklet is just the right size to take 8 x 10 prints upon fairly large mounts, while for smaller sizes, cabinets and so on, the size of the art paper can be made to suit the particular type of mount employed. The samples are mounted in the ordinary way upon the usual mounts that are used, and then a touch of stiff paste on the back of the mount will securely fix it into the booklet and allow of its being changed easily when desired.

In selecting the samples care has been taken to include an example of as many different treatments and subjects as possible, and each set includes the following: Lady's head with light background and a soft, "all over" treatment of lighting; lady's head with dark background and contrasty lighting effect; lady, three-quarter length, light treatment; lady, three-quarter length, heavy treatment; lady, full length, light, and ditto, dark. Then comes a similar assortment for men, and another similar set for children, while a group is placed at the end of the sets.

Every different style that we make has a separate booklet of this description, so that all styles can be seen if desired. Also, each different style has clearly written on the inside front cover full particulars as to the prices for one, three, six, and twelve copies, the number of positions submitted free, with the charge for extra positions (this applies only to the cheaper styles, as in the more expensive styles we make no limit to the number of positions), and also the charges for extra orders in this style. The customer can see these particulars, so that there can be no question later as to the correctness of the prices. The booklets are bound together by boring holes through the art paper and tying them neatly up with silk cord.

them neatly up with silk cord.

Having found this method so suitable and effective, I have lately made two more larger booklets, one for groups and at-home portraits and the other for exterior, interior, and miscellaneous subjects, So that instead of the receptionist having to make a search through piles of old, dirty and grubby prints when asked for something a little out of the usual, as in the past, there is at least something to show the customer immediately which will have the effect

of letting him know that we have done work of the particular nature he desires, and will at once inspire confidence as to our ability to undertake it for him.

The group and at-home booklet contains 8×10 prints as follows: 1, bride and bridegroom; 2, bride, bridegroom and bridesmaids; 3, general wedding groups; 4, family group; 5, school group; 6, choir groups; 7, general group of about twenty persons; and 8, general group of a large number of persons, thus giving a pretty good range. Then come an 8×10 at-home portrait of an old lady, an at-home indoor group, and an at-home portrait group of children in a garden; and lastly follow some examples of smaller sized groups.

The last booklet contains a varied assortment of subjects, among which are included house exterior, house interior, church (interior and exterior), two pictorial garden views, and two technical garden views suitable for real estate agents' requirements, a man on horseback and a horse alone, a motor-car, an interior of an electric-light installation house showing the machinery, a copy of an old painting, a dog, a cat, a sheep, and a bull and a group of cows in a field, so that among these there is almost sure to be an example of every subject which in ordinary reasonable expectation may be inquired for.

reasonable expectation may be inquired for. In addition to these booklets, which will last some time and still be clean and serviceable, newer specimens of all kinds are kept in a separate drawer in a room adjoining the reception-room. For present use there are three special booklets which have been in use all last year, kept for military portraits in the three different styles which we make these in, at prices of \$6.00, \$12.00, and \$18.00 per dozen.—British Journal of Photography.

How View-point Lends Dignity

The point of view has such an important bearing on the general appearance of portraits that it should be given as much attention as expression or posing. The camera is often too high for no other reason than the convenience afforded to the photographer.

afforded to the photographer.

The effect produced when the camera is too high gives one the idea that the sitter is short and squatty. The camera on a level with the sitter, or even lower, gives an idea of dignity and stateliness that is more characteristic of the bearing of a soldier and especially an officer.

Many photographers do not give the point of view proper thought and then wonder why it is that regardless of the way the figure is spaced in the print, it seems inclined to drop out of the bottom.

The same applies to standing figures as to a sitting position, though the fault is not quite so bad. All that is needed to see the effect in exaggerated form is to observe a speaker from a front seat below the platform and then from the balcony.

It isn't necessary to place your sitter on a platform when your camera can be lowered, but it is better to have a platform for the sitter and secure good results than not to lower your camera when you should. If you don't believe point of view has an important bearing on the general effectiveness of the portrait, try it out for yourself and see,

the portrait, try it out for yourself and see.

The man or woman who sits for a portrait will not tell you how it must be made—will not suggest the point of view and will not know why the picture does not please if the point of view is bad.

is bad.

The painter and photographer both choose their point of view and the difference in choice accounts for very much of the difference in the

portraits.

In most painters' studios the subject is placed upon a platform and the artist sits at his easel a foot or two lower. The subject is not only a foot or more higher but the artist's eye is considerably below the height of the ordinary studio camera.

The low point of view undoubtedly gives height and dignity and should be used by the photographer to the best possible advantage without over-doing. It is not *always* the best point of view, but it could be used more often in portraits of soldiers and in almost every case where the sitter is rather short.

Your customer will not know why such pictures are more pleasing to them, but they will come to you to have them made, and that is the all-important thing.—Studio Light.

Brighten Up Your Studio

HAVE you ever noticed, when moving from one house to another, how faded and damaged the paper and paint looked after your furniture and pictures had been taken out of the old rooms? Do you remember your surprise when you saw how shabby some of your furniture looked in the clean, fresh surroundings of the new house? A few years ago, everything looked spick and span, and you hadn't noticed the gradual change that was taking place.

This gradual fading and increasing shabbiness goes on just as rapidly in your business premises as it does in your private house. It is essential that you should realize it—and realize its effect on your business. Remember that in normal times a large proportion of your customers are women, and that women are more influenced than men by such things as faded wall-paper, soiled curtains, grubby paint, or shabby furniture.

Suppose a woman who hasn't been to your studio for a year brings her child to be photographed. What would she see? In many studios she would see exactly what she saw a year or two ago, except that everything would be a year or two older. The signs of wear and tear would be the only changes she would notice.

But, you may say, she comes to have her child photographed, and if she likes the photographs and gives an order what does it matter whether the appearance of the place pleases her or not?

How do you know that she is not thinking of having some photographs of herself? How do you know that she isn't looking for something new and striking? How do you know what she is going to say about you and your studio when she discusses her child's portraits with her friends? Your work may be good, but there are other studios where equally good work is done,

and where the customer who likes freshness and novelty has more chance of finding them.

Now that the holiday rush is over, you should walk round your premises and try to look at everything with the eyes of the customer who hasn't seen inside your studio for a twelvemonth. You will see the need of a little polish here, a bit of paint there; and, very likely, you will discover that the curtains would look all the healthier for a few days at the cleaners, or you may come across a threadbare patch in the carpet which could be covered up by a rug. Have a look at the outside too. Very probably you will decide to have the wood-work freshened up by a coat of paint, and your name over the door made a little brighter and more striking.

When you have seen to these things, you might also see about getting some new pictures for the walls, some new styles in printing processes and in mounts, a new way of showing your specimens, and a few fresh backgrounds for your studio.

The cost of brightening up your premises is insignificant. The stimulating effect on yourself and on your assistants alone is worth the money—but the rise in your reputation as a go-ahead photographer and the increase of your business will repay you a hundredfold.—Professional Photographer.

Waiting for Sitters

There are, perhaps, few trades or professions in which there is so much uncertainty as to the volume of business as in portrait photography. The big man does not feel it so much if he is provident; his fat times compensate for his lean times, and with even a moderate balance at his bank he can look at the prospect of two or three bad or almost blank weeks with equanimity. This is not the case with his struggling brother who has to live from day to day upon his takings, whose best week's receipts are small, and whose worst weeks almost spell privation. This state of things is not confined to the "cheap for as a rule he feels the pinch less acutely than the middle-class worker, whose clients have to keep up an appearance on a very slender income, and who are inclined to dispense with photographs in preference to other luxuries when funds are low. The remedy lies to a great extent in the photographer's own hands. He must not forget that he is an artist, but still less must he forget that he is a man of business-that is to say, that he has a studio, apparatus, and (usually) assistants for which and whom it is his job to find work. We were the other day talking to a busy city photographer, of whom we inquired, "How are the sitters coming in?" His reply was, "They don't come in; we have to go and fetch them." There is a whole sermon in these few words. The man who can "fetch" them gets the sitters, while the more dignified or less business-like one finds it hard to cover expenses. There are scores of nice little windows with a show of sepia platinotypes in narrow frames, behind them a green curtain, and behind that an aching heart, and all because the photographer will not realize that he is a tradesman, and that he is not bound by the rules which forbid lawyers, doctors, and stockbrokers to advertise.

very fact that he has a shop window, or its equivalent, should convince him of the fallacy of this attitude, and should encourage him to go a step further and to examine the methods of the milliner, the bootmaker, and the costumer, all of whom are catering for the class from which he

is hoping to obtain orders.

One of the greatest blunders which a photographer can make is to be an opportunist—that is to say, to vary his price for a certain article according to the supposed means of the customer, charging one man five guineas for the same picture which he would sell to another for three, This style of doing business is out of date, and. leaving out the question of morality, it does not pay. The public has got accustomed to the methods of the big stores, who sell at one price to all and demand prompt payment; but even the biggest cannot do this without advertising in some way. If you have a quarter of a mile of frontage you will be able to display and sell a vast amount of merchandise. Even then you are only appealing to the people who pass by and those who have already visited your store. But if you supplement this by circulars or by newspaper advertising you bring people to see your display, and profit accordingly. One of the greatest mistakes made by advertisers is to advertise their business instead of their goods. An advertisement of your name and business is equivalent to a shop window, painted over with gilt lettering upon it; an advertisement of your goods is the same window properly dressed. Many photographers are afraid that by advertising an attractive line in portraits they will be drawing customers away from their better-class work, but this only shows that they distruct their own business methods and ability. A prospective sitter may shrink from going to a studio of the old exclusive style for fear that the modest guinea he is prepared to spend will be treated with contempt, but if he knows that the photographer has a special half-guinea line he is confident in asking for that, and it is usually easy to induce him to order something better.

It is fairly safe to say that circulars posted in closed envelopes are probably the most effective and economical form of advertising for the ordinary studio. They must be well designed, well printed, and convincing in their appeal to the public, and these essentials cannot usually be evolved by the efforts of the photographer and the local printer. It is therefore necessary to resort to an expert firm of advertisers' printers who will put crude ideas into an acceptable shape at a reasonable price. First you have to convince people that they want photographs, and next that the photographs you offer are the sort which they want, and this can only be done by a skilled hand. It is a strange fact, but nevertheless an indisputable one, that a producer can rarely see the selling points of his goods. He knows they are all right, but it takes the skilled writer, the "ad.-smith," as they call him on the other side, to make the public believe it. To come from the general to the particular, our advice to the photographer who is tired of waiting for sitters is to go out to them by means of an attractive appeal setting forth the special style of picture which he wishes to sell. Typewritten

circulars or enclosures should be avoided, as they detract from artistic effect. All that need be said can be said in type, and illustrations showing the studio or miniature reproduction of the advertised style will be helpful. It is, perhaps, hardly necessary to add that a good display of specimens of the special offer should be on view at the studio, and that the necessary mounts, etc., should be in stock, so that orders may be promptly filled.—British Journal of Photography.

The Craving for Business

It is one thing to get orders, another thing to execute them satisfactorily, and a totally different matter to make a profit on them. These things must be separate and distinct departments of any well-organized business, entrusted to men who have special gifts in each of these directions. It would be absurd to expect a traveller to superintend the execution of his orders and be responsible for bringing them out at a profit. At any rate, it would very soon dull all his abilities for getting orders. Equally foolish would it be to expect a man who may have splendid gifts for organization indoors, to go out with any chance of success outdoors in search of orders. Again, how futile it would be to suppose that a cashier or an estimating clerk would make any success as a canvasser, or even as the manager of any of the executive departments of a warehouse or factory. With his mind full of niceties of figures, he would lose the chance of getting an order while he was weighing the chance of making a profit, and his soul would rebel against the idea of suffering a loss in order to make a gain in some other direction.

There are occasions in commercial life when

There are occasions in commercial life when those who run a business must stand by with equanimity and see a serious loss going on which cannot be checked, except to the injury and future detriment of the concern. This can only be tolerated in the case of a man of strong character and with the reputation of past achievements, not simply the dreamer who imagines he can go on losing money indefinitely to realize imaginative future profits. The man who knows his own strength can bear a loss with an easy spirit, bearing in mind the counsel: "Whatso-ever thou taketh in hand, remember the end,

and thou shall never do amiss.'

It is a true and invariable law of nature, which we find exemplified throughout the whole circle of sciences, as well as on every side of our social life, that there never can be a gain without some contingent loss. In chemistry we ask for more potency of chemical action, and when we get it we find the gain is almost neutralized by some complicated reaction. In mechanics we ask for more speed, but to attain it we lose in power and in directness of action. In electricity we ask for more intensity, and what we gain in some directions we lose in efficiency in others. And so it is in business, the study of loss is equally as impor-tant as the gain; even so is it in our individual life that the attainment of wealth and influence is not without its disadvantages. Happiness does not alone lie in the possession of wealth, and many a man who has gathered in the fruit of his life labor has found it to be only as sour apples. The only true happiness is the absence of everything that tends to make a man unhappy, and money will not purchase that immunity. It will not ease the troubled conscience, nor allay bodily pain, nor bring sleep to the restless. "Can gold calm passion, or make reason thine? Can we dig peace or wisdom from the mine?"

The craving for business is in some men as the insatiable desire for wealth. They cannot bear to lose an order, however unprofitable, and thus the gain of the order is too often a minus quantity. The man who craves for orders at any price is not far removed from the miser craving for gold. Nothing can be said against pushful determination to get orders, but the man who carries it to the extreme must either rob himself or his firm of the due rewards of business, or must resort to deception and intrigue in order to make up his profits. It no doubt requires a firm will to let an order go by, but the man who can do it will be the gainer in the long run, not only in pocket, but probably also in self respect.

It also requires a sound judgment to determine when to forego an order which is just on the border-land between profit and loss, and the experience which will enable one to determine this can only be obtained by a thorough grasp of detail and sound knowledge of the subject. In giving estimates nothing should be left to guesswork, but should be based on careful calculation. Then, if it comes to competitive bargaining, you know where you are and how far you can go. When labor and material are in question, it is only the firm which has its men thoroughly in hand, and knowing their capabilities and their economy of working, that can hope to compete. When it is a question of the sale of a commodity for which there is a market price, it is the firm whose financial resources and business system are the best that is likely to get the order. It amounts to this,

then, the better organized a business is the better it is able to compete, and when it comes to estimating against a firm of equal standing, the chances of getting orders are fairly equal. When you are pitted against the reckless estimator, it is better to be without the work than to try and get it at a price which figures at a loss on your estimate.

Of course, if there is certain work which is speculative and doubtful, it is open to consideration whether to take on the job on chance of being able to make a better profit than anticipated. Circumstances will largely influence this; it may even pay to lose, as we have already pointed out, in order to secure a gain in some other way. But it is senseless and suicidal to accept orders at any price for no other reason than that you are told your competitor is lower.

What is the use of toiling and worrying merely to get orders? Business exist for making a profit, not for making a show. You don't work for fun or to please nice customers. Your business has got to bring in sufficient money to prevent you from feeling the want of that commodity—just sufficient to make you feel sure of your position and to place you above those small schemes and struggling in which the mass of the people have to pass their existence. Sufficient for the present and enough for the rainy day should be the sum of human happiness. When you have got that you can rest on your oars and glide idly down the stream of life, leaving others to go on struggling among the rocks and rapids.

How often do we see men doing apparently a big business, yet making nothing for themselves, slaving on year after year to make a bigger turnover, yet never gaining an additional farthing toward their own personal comfort, chained to their task, and doomed to "everlasting hope," always rolling the stone uphill, yet never reaching

the top!



VIEWS AND REVIEWS



Brains in a Business1

Unless I had seen with my own eyes the vast amount of work involving a variety of photographic processes which Mr. Matthews is daily carrying out in his splendid modern factory, I should have doubted the existence of such a marvelous organization. Many dealers are interested in obtaining a number of well-produced reproductions from a negative, whether in postcard or any other form, and they are equally interested in procuring artistic bromide enlargements at a price which will leave them a good

¹ This interesting and suggestive article from *The Photographic Dealer* should be read by everyone interested in trade finishing.—EDITOR.

profit. One of the chief considerations in such circumstances will doubtless be rapid execution of the work and prompt delivery of the goods, and, for this reason, I have no doubt an account of what I saw recently at Idle Road, Bradford, will prove interesting reading.

will prove interesting reading.

A penny tramway ride from the center of the City of Bradford and two or three hundred yards' walk along an elevated roadway, during which I enjoyed the pure, keen Yorkshire air, brought me to my destination. Mr. A. H. Anderson, the general manager, received me and introduced me to Mr. Matthews, whom we found engaged in experimenting upon a new drying machine of his own design and construction. In a few moments I had explained to me the exact nature of

the business which was being conducted on the premises. It consists in the receipt of negatives from professional photographers and dealers all over the country, from which varying quantities of bromide prints or cards are made, and dispatched promptly according to scheduled times. The making of bromide enlargements and largesized contact prints is also a very important feature of the firm's business, and incidental to these processes are retouching, vignetting, sketch work, copying, titling, coloring, etc., all of which are carried out by a staff of expert workers. Over three thousand customers are on the firm's books, and the volume of work which literally glides through the factory every working day of the week needs to be seen to be appreciated. I should add that many of the negatives have to be developed as well as printed from, and this process occupies quite a considerable staff of photographers.

In the dark-rooms I was permitted to watch the operation of development which is conducted upon the "Universal" developing system invented by Mr. Anderson himself. With the Anderson formula and calculator good, clean, vigorous negatives are obtained practically free from stain, although a pyro developer is used. Tanks are employed in this case, but the system is equally applicable for dish development, and, for the benefit of other trade printers, I may mention that the instructions and calculator for the "Universal" developing system are published by Mr. Matthews at 25 cents or postpaid 30 cents.

by Mr. Matthews at 25 cents or postpaid 30 cents. By the aid of a dark-room clock, blackboard, and chalk a continuous stream of accurately developed negatives is constantly passing through this department. After the usual washing process the negatives are dried upon a drying machine, which does its work at the rate of six hundred negatives an hour. This machine, like all the others in the factory, has been specially designed and constructed by Mr. Matthews, and is the result of the application of his brains plus many

years' practical experience. Having seen the negatives developed and dried, we pass to the printing rooms, where five somewhat massive automatic vertical printing machines are in action; anything more unlike the orthodox photographic printing rooms it would be difficult to imagine. The machines are adjustable for varying sizes, but, as an example, let us take the most popular size, the postcard. The operator slips a negative together with a sheet of bromide paper into the machine, touches a button, and the machine does the rest. With almost lightning rapidity a suitable exposure is made, and the paper shifted on one space and another exposure follows. This operation is automatically repeated until six prints are made in a row, when the paper drops, the travelling motion of the paper is reversed, and six more exposures made. This goes on until twenty-four exposures are made on the one sheet of paper, when the machine automatically stops for the operator to put in a fresh sheet of paper, and, if necessary, to change the negative. Should only twelve prints be required, it is a simple matter to make the machine stop at that or any other row. The capacity of this automatic printing machine is 2000 per hour, so that with the five machines in

operation we get a total of 10,000 prints per hour, and I forget how many girls this keeps going doing the developing and fixing. All processes are carried through in large sheets, and the big dishes, being somewhat heavy, are automatically rocked, which also means a considerable saving of labor.

For large-size contact prints a horizontal type of machine is employed which, with the adjustable guides upon a flat bed, renders the work extremely simple and accurate. Large racks in the drying rooms receive the printed sheets when they are fixed and washed, and by a system of fans the warm air is circulated so as to speed up the drying as much as possible. But with the ever-increasing output Mr. Matthews has come to the conclusion that nothing short of a drying machine which will permit of the sheets entering wet at one end and coming out dry at the other will properly meet the case. He has constructed such a machine, and although it was not quite completed at the time of my visit, I saw a number of wet sheets fed into the machine and turned out almost sufficiently dry upon delivery. Mr. Matthews explained that with a little regulation of the speed it would turn the "almost sufficiently" into completely dry.

Side by side with the apparatus used for copying is an exceedingly clever photometer, which is so extremely sensitive that a passing cloud is sufficient to slightly alter the reading. This is a recent invention of Mr. Anderson's, and enables the most accurate exposures to be made. In passing through the works I noticed a rotary stand on wheels carrying a number of chemicals on shelves, constructed somewhat on the lines of a revolving bookcase, and in answer to my query Mr. Matthews said, "Oh! yes, that is our moving chemical department. It enables them to sweep all round, and is a preventive against dirt collecting."

Dry mounting is carried out in the usual manner, and a letter-press printing plant is utilized for supplying all sorts of special books and stationery for the firm's own use as well as printing postcards. In the cutting rooms, guillotines first accurately cut the sheets of twenty-four prints up into four strips with six on each, and these are afterward divided into single prints. Now, this process may appear simple to the reader, but it is not so simple as it looks when it is remembered that the margin round each print must be accurate. By the addition to each guillotine of a little rotating scale, which has been cleverly worked out on the premises, a girl with practically no experience can cut the sheets up rapidly and with perfect accuracy.

In the artists' department a long bench is divided into sections where a number of retouchers are at work under the most favorable lighting conditions possible. Seated at a long line of easels are skilled artists deftly manipulating air-brushes, etc., over the surfaces of enlargements, vignetting negatives, etc. The air for these brushes is supplied by a pump in the works, so that all treadle work is dispensed with.

Enlarging is an important branch of the business, and considerable space is devoted to the necessary apparatus and appliances.

Now, I think I have shown that the actual photographic processes as carried out by Mr. Matthews are reduced to the simplest possible form, and that they are combined with arrangements which provide for marvellous rapidity without the necessity of personal supervision. This absence of personal supervision of principals is an important point, since it leaves the brains that designed the business free to develop im-

provements and extensions.

It is one thing to attract a number of customers by a promise of "same day" service, but it is quite another matter to successfully carry out such a promise, particularly when large quantities have to be dealt with. It is just here that Mr. Matthews has scored such a fine success, and I attribute this largely to the fact that, combined with his own engineering skill and practical photographic knowledge, he has in Mr. A. H. Anderson, his manager, a splendid example of business brains and general aptitude. Let me briefly relate what happens in the conduct of the business.

As many as a thousand plates are handled in a day and upward of 30,000 and 40,000 glossy postcards can be turned out daily. With such figures as these to deal with one can readily imagine that a parcel post delivery at 11 o'clock in the morning would be quite useless, and so it came about that Mr. Anderson arranged with the postal authorities to send up by special messengers all their parcels at 7.30 in the morning. The system of "express" post was abolished, and in order to cover the delivery charges with the postal authorities and at the same time to clearly distinguish rapid service orders a system of "same day" labels has been instituted. These labels are red in color and are sold to customers at 35 cents per dozen. The firm also supplies boxes and corrugated paper for packing negatives, and all negatives sent to them should arrive in their packing. The morning's post is opened at a huge counter, parcels bearing ordinary labels being dealt with on one side, and special labels on the other side. Any cash contained with the order is extracted, the amount entered on a slip, and the two placed together in a basket for the counting house. The customer's instructions are entered upon special cards, a white card denoting that postcards are required, a green card if postcards and mounted work, a blue card if mounted work only, and a red card for "same day" service. A salmon card denotes that the order is intended for same day service but that it arrived late. The standard method of packing employed greatly facilitates the handling of orders, and does away with the necessity of keeping track of customers' cases, etc. The corrugated card is cut to standard sizes and exactly fits the cases. Customers' letters or orders are all numbered and dated, and a duplicate order form is made out and numbered to correspond. One half of this order form acts as a job ticket and accompanies the work right through the factory. Each operator fills in particulars on this ticket, and when it gets into the dark-rooms they are allowed to use the back of the card to avoid the trouble of filling in exact spaces. A schedule of orders to go out today hangs in the manager's office and, pointing to the

first item on the list, Mr. Anderson called my attention to the fact that 154 plates were received from that customer the previous evening, and he added that all the negatives would go off that day, together with prints from each. All orders are dissected and entered on one card for each day, so that the analysis for the output of the factory for any one day can be quickly referred to.

In many cases it happens that a photographer sends a negative, orders a number of prints from the same, and requests that the negative be-retained for further orders which will follow later. This involves a system for filing the negatives, and Mr. Anderson has devised the cleverest that I have yet seen. The cardboard negative boxes all bear a distinctive number on one end. In dealing with over three thousand customers these numbers run into big figures, and to attempt to arrange them numerically in racks would necessitate no end of shifting and changing about, and it would then be anything but an easy matter to pick out a particular number. The system in force at Bradford is perfectly simple. Five cases or shelves only are required, marked $\frac{1}{2}$; $\frac{3}{4}$; $\frac{5}{6}$; $\frac{1}{8}$; $\frac{9}{10}$. The negative boxes are sorted by the last figure and placed in their respective divisions. From this it will be seen that if a customer requires more prints from a negative the number of his previous order is turned up, and, supposing it to be 2096, the negative will be found in the division marked 5.

No Credit Customers

In the counting house Mr. Anderson unfolded his system of bookkeeping, filing, etc., and simply electrified me by telling me that the firm had no credit customers whatever. Their three thousand odd customers were all bona fide cash customers, and under no circumstances whatever would the firm deviate from their established rule, never to give credit. Opening a tiny loose-leaf ledger in front of him, Mr. Anderson asked me to name any photographer in the British Isles. I named one. In an instant he opened the page and showed me that man's account, which revealed the fact that \$5.25 stood to his credit. I named another, and found that the account balanced. I named several others with the same result, till at last we picked up one who actually owed a penny. "Ah!" said Mr. Anderson jocularly, "that is indeed a bad fellow, but we did not stop the goods, though, strictly speaking, we ought to have done." I asked if they did not experience considerable difficulty in getting photographers to come into line over this cash business, and was informed that all sorts of people had said that it was an insult to be asked to pay cash, but as soon as they found that it was merely a part of a system which enabled the firm to turn out such good work so promptly, and at such moderate prices, no further objection was

The filing of orders is so arranged that in a few seconds a young lady was able to bring to me a copy of the last order received from a photographer that I had named, which showed that four negatives had been made and twenty-five dozen cards supplied. It further showed the date at

which the order was to have been executed and when the cards were actually despatched. have explained that for every order a card and counterfoil is made out, and the card follows the work through the various departments. counterfoil goes straight into the office, and one of the first things done in connection with it is to ascertain whether the cash sent is sufficient to cover the work or whether the customer has enough money on deposit. In the case of any deficiency a pro forma invoice is at once despatched so as to save unnecessary delay. No order book is required, a flat file with thumb index does the trick. I should also mention that in the loose-leaf ledgers only the right-hand pages are used, as it is found to be far too costly in time to use both sides. Invoice pads are used with corresponding numbers on counterfoil and invoice. Any number of these may be used at the same time as required, whereas if folioed invoice books were used separate systems of filing would have to be employed. No daybook is used, the posting being direct from invoice to ledger, and so long as an account is in credit nothing but red figures are used, but should a debit balance appear, it is entered in black ink, and is literally a black mark against the customer. The sorting of invoices is neatly carried out by means of a portfolio with alphabetical thumb index. invoices are placed into the index in their respective places, and entered up from the alphabetical file into a recapitulation book for the purposes of double entry. The various items of work executed in the factory are dissected daily, so that the exact amount of enlarging, copying, printing etc., can be seen at a glance. Adding machines are successfully manipulated by young lady operators, and the time-saving quality of these machines was clearly demonstrated to me.

Having seen practically the whole of the sales side of the business, I was next shown the system of purchasing, stock keeping, etc. "We have never been stuck for stock, notwithstanding war, railway strikes or any other trouble, and we attribute this fact entirely to our system of stock keeping," said Mr. Anderson, and he produced another loose-leaf ledger, which revealed at a glance the exact amount of paper, card, packing, string, chemicals, etc., that were held in stock at that particular moment. As a check upon the system, I asked how many plates for copying were in stock, and in an instant the page was turned up, which disclosed that there were 356 boxes of half plates in stock. Other examples showed that 70 lbs. of medium string, 141 lbs. of hydroquinone, and 38 gallons of formaldehyde were in stock. I walked through the spacious stock rooms in which the loaded fixtures denoted that I was in the land of plenty, and the key to the stockkeeping system is that immediately upon arrival all goods are entered upon a "consignment receipt" note. Here the words date, sender, goods, cases, our order number, entered stock, file number, remarks, are printed, and opposite these the particulars of the goods received are at once entered. The exact quantities of the goods received are entered in the stock book, and quantities abstracted are entered in red ink and deducted, the balance showing in red ink figures, and as soon as any new stock is added

an entry is made in black ink in the stock book. Just as all processes in the factory are organized to work smoothly without control, so the homemade systems adopted at the business end of the concern are all arranged to secure accuracy without constant supervision.

It has been my lot to go through many works

connected with the photographic and other industries, but I have never seen a more perfect system for handling large quantities of material than that in vogue at Idle Road, Bradford.

Photographic Dog Show

A dog show in which the photographs of the dogs were studied instead of the dogs themselves was held under the auspices of the Blue Cross War Relief Fund. Entries for the show closed on January 28 with Fred Harries, manager, New York City. The show, because of its novelty was nation-wide in scope, and many competitors from many States sent in photographs of dogs. There were classes for all recognized breeds, with first prizes according to the number of entries in each class.

The wide scope of this Photographic Dog Show was evident in the conditions of the special competitions that supplement the regular classes, but even in these, with few exceptions, it was the dog that counts, not the excellence of the negative or the print. Kodak pictures had as much consideration as highly finished and mounted photos in the classes and extra compe-

titions.

This new and novel method of exhibit arouses much interest and brings to the photographer another opportunity.

Prize Winners in the 1917 Kodak Advertising Contest

THE Eastman Kodak Co. announce that the prizes in the 1917 Kodak advertising contest were awarded as follows:

First—George J. Botto, New York City, \$750. Second—William Shewell Ellis, Philadelphia,

Pa., \$500. Third—W. B. Stage, New York City, \$350. Fourth-William Berger, Jr., Germantown, Pa., \$250.

Fifth-Edwin G. Dunning, New York City,

Sixth—Chas. Luedecke, Jr., Philadelphia, Pa.,

Seventh—Fashion Camera Studios, New York City, \$100.

-William Shewell Ellis, Philadelphia, Eighth-

Pa., \$100. Ninth—Hobart V. Roberts, Utica, N. Y., \$100.

Tenth—Edwin G. Dunning, New York City,

Eleventh—Hobart V. Roberts, Utica, N. Y.,

Twelfth-Holmes I. Mettee, Baltimore, Md.,

Thirteenth—Charles Leudecke, Jr., Philadelphia, Pa., \$100. Fourteenth-Mrs. Arthur Bazille, St. Paul,

Minn., \$100.

Fifteenth Salon and Twenty-seventh Annual Exhibition of the Toronto Camera Club

In affiliation with the Royal Photographic Society of Great Britain this Salon is to be held in the Art Museum of Toronto, 26 Grange Road, May 2 to 18, 1918. The Toronto Camera Club's annual exhibition is intended to bring together a thoroughly representative collection of all that is best in pictorial photography, and the Committee hopes that this prospectus will be accepted as a cordial invitation to submit new and distinctive work. The Exhibition is international in character, and is open to members and non-members alike without distinction. The Committee welcomes the friendly coöperation of photographers, at home and abroad, in its efforts to make the forthcoming Exhibition a worthy successor to those which have preceded it, and a true reflection of the present position of pictorial photography. Blanks with conditions of entry can be had by applying to the Secretary, Mr. R. M. Browne, 2 Gould Street, Toronto, Canada.

Central Dry Plate Co. Make Special Announcement to the Trade

Owing to the constantly increasing cost of raw material (chemicals, gelatin, glass, etc.) entering into the preparation of dry plates, as well as the constantly increasing labor cost, the Central Dry Plate Company are reluctantly compelled to announce a slight decrease in discounts effective March 1, 1918.

The following discounts will be allowed from standard list prices of central plates. Central "comet," 35 per cent. and 10 per cent.; central "special," 35 per cent. and 10 per cent.; central "special XX," 30 per cent. and 10 per cent.

In addition to above a cash discount of 10 per cent. will be allowed if remittance is received within thirty days from date of invoice.

These discounts are subject to change without notice.

Notice

WE learn that Samuel Wein, of this city, has represented himself as being connected with our organization. We wish to state that Mr. Wein has never been associated with this company in any capacity and we would notify our readers that we cannot be responsible for any obligations he may assume for The Photo-GRAPHIC JOURNAL OF AMERICA.

Eastman School of Professional Photography Temporarily Discontinued

During the past year the Eastman School has met with the greatest success of any year since its inception. It is not the desire to curtail a plan of service to the professional photographer, of which the Eastman School has become a very important part.

Conditions, however, have made necessary by the preference given to shipments of food supplies and munitions—conditions which the school had already begun to feel in its transportation problem, and it seems wise to discontinue until further notice.

Transportation has been one of the greatest problems of the Government, and transportation in all its forms must be conserved in every way possible. The school required express transportation facilities for ten or twelve thousand pounds of apparatus.

The American Institute of Photography

Announcement is made of the American Institute of Photography, an organization not for profit, incorporated under the laws of Ohio

as of April, 1917.

The charter members of the Institute, we understand, are all of highest standing and accomplishment, representing every branch of photography in this country. Mr. E. B. Core, well-known and respected throughout the fraternity, is named as the President. We cannot but regard this as an important move in the right direction toward the uplift and dignity of the entire photographic profession. Further particulars will be announced later on.

Papers Discontinued by the Eastman Co.

THE Eastman Kodak Company announce that they are discontinuing the manufacture of photographic papers included in the following list, as other grades in all cases cover the work for which these papers were intended: Azo Grade A Soft, single weight; Azo Grade D Soft, single weight; Azo Grade D Soft, double weight; Azo Grade G Hard, single weight; Azo Grade G Hard X, single weight; Artura Chloride, medium rough; Artura Chloride, heavy smooth; Bromide Standard A; Platino A; Platino C; P. M. C. No. 1; Insurance A; Nepera Platinoid, rough and glossy; Velox Special Rough, single weight.

The users of Azo Grade A Soft and D Soft single weight and D Soft double weight will find that corresponding brands of hard can

readily be substituted.

Where Azo Grade G hard and G hard X single weight have been used, Azo Grade A hard and A hard X can be substituted. The difference in the surface of these two papers is very slight and we believe that the Azo A paper will be found equally as satisfactory.

The demand for Artura Chloride medium

rough is not sufficient to continue its manufacture. As a substitute for Artura Chloride heavy smooth, Iris Grade C may be used, as the

surface is practically the same.

As a substitute for Standard A and Platino A Bromide, Matte Enamel can be used, and for

Platino C, Standard C is a satisfactory substitute. For P. M. C. Bromide No. 1, P. M. C. No. 5 can be substituted.

Insurance Bromide B can readily be substituted where A was formerly used.

Nepera Bromide Platinoid can be substituted by Matte Enamel, the rough by Standard C and the glossy by Enamel.

The demand has practically been eliminated

for Velox Special Rough single weight.

Market Changes in Prices

THE market is still nervous and changeable, and scarcely a week comes around that some item does not announce a revision of prices. Rarely there is a decrease, but the rule is an advance in

the price.

Lenses have both advanced and been restricted as to the sizes and styles that the manufacturers are offering for sale to the trade. Bausch & Lomb have published a new price sheet, which shows an advance of about 10 per cent. on all of the smaller sizes, but the larger sizes in the more popular numbers have been omitted from the list, and we are advised that the government is taking all that they can turn out of these larger lenses, and that, therefore, they are not able to offer any to the trade. The Wollensak Optical Co. announce an advance of 15 per cent. on their entire line of lenses, and they will have a new set of prices out in a short time. Of course, these advances are caused by heavy government demands, shortage of glass and labor, and also increased manufacturing costs, due to wages and new equipment.

Glass of all kinds is affected also, and there are advances announced in ruby, orange and ground glass. These, however, are not great and will not cut very much figure. Kodaks, Graflexes and two of the cheaper Century portrait outfits have been advanced an average of 10 per cent., while leather and canvas carrying cases show still larger advances. In fact, all leather cases have had several advances in the past six months, and this adds on just a little more. Enamel trays also are among those present in the list of advances. For instance, the 8 x 10 size is now \$1.50 and the 10 x 12 and 12 x 16 are \$2.50 and \$4.00

respectively.

Burke & James announce a list of advances among which we note plate holders and Packard shutters. These latter have advanced quite sharply, and all sizes are listed at new prices.

Card mounts and folders are still stiff and hard to get. The new spring designs are just appearing, and prices show a slight increase over styles of similar quality and appearance in last year's line. Collins has published a revised price list affecting last year's style, many of which show slight advances, but the other manufacturers announce a rather large number of lines discontinued, which will be replaced by new lines that will be offered at about the same prices or slightly increased prices. Nothing startling, but just a general hardening in the values.

Hawkeye film has advanced slightly, and the jobbing discount will hereafter be 25 per cent.

Among chemicals there have been constant price changes. These fluctuations come without notice, and manufacturers fill orders at the prevailing price on the date of shipment, and will not accept any contracts or agreements for quantities at a fixed price on other than immediate shipment at current prices. Perhaps the most notable of the recent price changes are those of hypo and acetic acid. Both of these items have had sharp advances, and hypo is now \$4.00 per keg of 100 pounds and 10 cents per single pound. At the present writing we are not able to give the full scale of prices on acetic acid, but the

advance is about 30 per cent. Carbonate and sulphite of soda show a slight advance, the carbonate now being 23 cents per pound, while the

sulphite is 29 cents.

But of quite as much importance as price change is the question of obtaining goods. most difficult problem arises in the matter of keeping up a full stock of the heavier goods, such as cards, plates, hypo, sulphite of soda and the heavier chemicals. Orders are placed well in advance of requirements, and the first delay comes from the inability of manufacturers to ship promptly, due to the fact that they have been held up on certain kinds of raw stock and are behind in filling their orders. But even when the order is filled and the goods shipped, there is absolutely no assurance that the goods will be received within any reasonable space of time. Freight is sidetracked to make way for what are designated as essentials or war requirements, and service that formerly was dependable in a week now varies from four to eight weeks. In the bulk these goods are not practical to come by express, as that adds very materially to the cost. Nevertheless, it has been necessary to get them in small quantities that way, in order to fill pressing orders. The very greatest efforts to anticipate demand and possible delays are not sufficient to prevent shortages on lines that take an unexpected spurt in their sales, and all that can be done is to hold up the order or offer something else that is similar. A complete embargo for a set time has been threatening, and in case this should go into effect it will further complicate the situation.

The numerous delays, extra express and loss of sales have added materially to the expense of doing business, or if counted as cost of merchandise, it has added quite a bit to the original cost of the goods. The radical orders of the government, enforced to afford relief to the situation, have not yet had their full effect by reason of the unprecedented snows and sleets that have caused unlooked for blocking of transportation. A spell of good weather should make a difference, and the relief may be just deferred a little bit. We believe that the government is doing its best to help everybody, but we must needs be patient under present circumstances and devise ways and means to adapt our requirements to the existing

conditions.—Trade News.

"Modern Photographic Developers"

This latest number (167) of the extremely useful series of text-books, *The Photo Miniature*, describes practically every developer in use to date; what these new developers are made of; their origin; and how they compare in capacity and usefulness with the developers they claim to replace—getting behind the innumerable fancy names—with an abundance of other serviceable and timely information. Indeed, this is one of the most valuable numbers in this entire series and forms a veritable encyclopedia on developers. A book all photographic workers will welcome and need. Price, 25 cents. Tennant & Ward, publishers, 103 Park Avenue, New York City, or through your local dealer.

Death of C. H. Hewitt, F.R.P.S.

We regret to announce the death of Mr. C. H. Hewitt, on January 15, at Elstree, England, at the age of forty-five. Mr. Hewitt, we learn, had been in ill health for the past two years, and was obliged to relinquish his position of a deputy-principal of the Photographic School at the London Polytechnic. He was, however, actively engaged in photographic literary work to within a few days of his death. His passing will be felt by the entire photographic world, for his writings were always valued in this country as well as abroad by the many readers who profited from his knowledge and long experience.

The Haloid Company

At a recent meeting of the board of directors of the Haloid Company the following officers were chosen:

Gilbert E. Mosher, President; J. Milnor Walmsley and Edwin C. Yauck, Vice-presidents; Joseph R. Wilson, Secretary-Treasurer.

Directors were also chosen as follows: Gilbert E. Mosher, Joseph C. Wilson, J. Milnor Walmsley, Edwin C. Yauck, Erickson Perkins, Joseph R. Wilson and Frederick W. Zoller.

The company paid 8 per cent. in dividends during 1917 and reports the largest volume of business in its history. This is due to the universal satisfaction which the Haloid product has given and the addition of the brand Haloid Cameo, noteworthy for the fine Sepia tones it gives. Then, too, there has been the big wartime demand for photographs, which has kept the Haloid factory humming day and night to keep abreast of orders.

Photographic Reading

It may be safely stated that photographers, as a class, do not spend sufficient time in "reading up" their subject. In many cases their knowledge does not extend beyond the minimum necessary for their practical purposes. This is a pity. Apart from the pleasure and interest derived from a larger acquaintance with the subject, they would find that increased knowledge would mean increased power, even in the comparatively limited area of their own work.

Nothing but good can result from the acquisition of a fair all-round knowledge of the subject as a whole, so that at least the important outlines shall be grasped; and the winter months provide the best opportunity for acquiring this knowledge, inasmuch as practical work usually makes less demands upon one's leisure than at other times. For such a purpose, every photographer should have at least one general book, from which he can gather an acquaintance with the many processes and methods, and with the basic principles which underlie them.

It is obviously impossible, however, that a book of this kind can deal in minute detail with every corner of the field. This is where the special treatise comes to the rescue. A photographer who makes enlargements, for example,

can obtain a good deal of the information he needs from such a book: but he should certainly supplement it by reading books that deal with this branch of work only, as they will treat the subject in a more exhaustive manner. The best course to adopt in the case of any particular branch of photographic work is, first to master the broad facts from a general treatise, and then fill in the details from a special one. It is assumed, in all cases, that the reader will not take the first book that comes to hand, but that he will be at some pains to select the best available.

Some photographers elect to explore one or more of the by-ways that open out from the direct photographic road, and down which it is barely necessary for the traveller on the broad highway to glance. They take up the study of optics, of chemistry, of photomicrography, of the kinematograph, of color photography. Others devote themselves to research work and invention, and achieve results both in practical work and in theory that are of the utmost value and importance. To all of these reading is vital.

In addition to all this there is much helpful reading to be done on topics that have a bearing not only on photography but on other modes of graphic art. Much of the information and knowledge necessary to the artist, the designer, and the sculptor, is equally necessary to the photographer in, at any rate, some phases of his work. Herein is to be found guidance that too many would-be pictorial photographers neglect. The charge is often urged against them, and frequently with justice, that they are ignorant even of the elementary principles of art-that they have not studied so much as the vital question of composition. It is true that there is a good deal in this kind of literature that hardly comes within the practical range of the photographer, but it is safe to say that there is still more that does concern him. The retoucher has a different end in view from that of the sculptor, the modeller, and the portrait painter, but some of the knowledge essential to them is equally essential to him; and the lessons of the life-class have a purpose for the photographer as well as for the painter and the draughtsman.

Hence it follows that works upon "art," in the broad sense, especially when adequately illustrated, should certainly come within the photographer's reading if he apires to do any work that shall rise above the merely mechanical.

Indeed, the photographer is harly likely to err on the side of too wide and varied a range of reading. But to reap the full advantage of his study he must see to it that his reading is not casual and perfunctory. He should make notes. He should be on the alert for those things which particularly concern whatever aim he has in view, collect them, sift and sort them, and finally arrange and dovetail them into a complete and coherent whole. The photographer who does not read up his subject at all neglects one of the most potent sources of help and inspiration; he who reads widely, and with a purpose, is taking the surest road to final complete success.—

Photography.



WORKROOM

ONTAINING THE LATEST PROCESSES, FORMULAE AND APPLIANCES NEEDFUL IN THE ART OF PHOTOGRAPHY FOR THE OPERATOR & WORKER

MATT ALBUMEN

COLD DEVELOPER

OUTDOOR PHOTOGRAPHY IN WINTER

PHOTOMICROGRAPHS IN COLOR

AFTER-TREATMENT OF NEGATIVES

DEAD-BLACK VARNISHES FOR PHOTOGRAPHIC WOODWORK

A WATERPROOFING FOR WOOD DISHES

To Distinguish the Coated Side of Rough Bromide Paper

HOME PORTRAITURE WITH A TINY CAMERA

FRAMING PHOTOGRAPHS

ENLARGING-WITH LIMITED ACCOMMODATIONS

LARGE-FOCUS WORK WITH SMALL CAMERAS

DEFINITION

FRILLING; BLISTERS; HARDENING BATHS FOR NEGATIVES

TRANSPARENCIES AND LANTERN SLIDES BY THE FERRO-PRUSSIATE PROCESS

ENLARGING WITHOUT A CONDENSER

CELLULOID LACQUER FOR CAMERA BRASS-WORK



THE WORKROOM

By the Head Operator



Matt Albumen

Good prints on matt albumen are the only ones that equal fine platinums in tone, surface, and quality. Bromides certainly resemble the latter, but the gelatin coating prevents the achievement of equally perfect results. Matt albumen has practically no coating, certainly none that is distinguishable, since it is necessary to mark the paper in order to distinguish the sensitized side. The tones range from the nearest approach to red chalk carbon obtainable in an imitation to the beautiful steel-gray characteristic of platinotype.

An exceptionally varied selection of surfaces are obtainable, including the usual smooth matt, rough white, cream, and some unusual effects in screen grain, linen surface in card and paper, cream and white, also Japanese vellum.

The only drawback of a process capable of

The only drawback of a process capable of yielding the most artistic results is the care required if permanency is to be ensured. Careless handling may lead to fading, partially or wholly, in a few days. Properly handled, however, the results are at least as permanent as collodio-chloride, a process which matt albumen resembles to a very great extent. The results are undeniably charming. The point is, can you trust your assistants to carry out thoroughly and conscientiously the elaborate washings absolutely necessary for satisfactory stability? As some safeguard in this matter we would suggest that the assistant fills in a time-sheet giving the exact time of starting and finishing toning; these can easily be checked occasionally, and although it does not absolutely ensure application, it goes a long way toward it.

As received, the paper is packed face to face, marked on the back. One peculiar point about storage is that, unlike any other paper, a damp place is the best; at least, for a few days before use. Paper that is slightly damp undeniably prints more brilliantly than absolutely dry. One finds that it is almost as difficult to keep suitably damp as it is to keep other paper bone dry.

dry.

We use a platinotype storage tin with a damp sponge in the calcium receptacle. This is much better than steaming the paper before use, as this is liable to leave shiny patches that will not

disappear.

Do not print in the sun. Print for warm tones about the same depth as for P. O. P.; for black tones and browns obtained by means of two tonings print slightly darker. Or, in other words, print as for C.C. No C.C. toner will have the least difficulty in going straight from C.C. to matt albumen, toning manipulation and toning baths being identical. The prelimi-

nary washing is for twenty minutes, no matter what the after-treatment is to be. So important an effect has this washing on resultant purity and evenness of tone that the very greatest care and attention should be expended upon it. Each print must be constantly moved about and the water changed as soon as milky. The most efficient and recommended method is to transfer prints one by one from one dish to another. For this, big sinks are essential, as dishes must be large.

Great stress will be placed on the necessity for thorough, complete washing at every stage, and it cannot be too forcibly impressed on the reader that if even results are required no curtailing or carelessness is allowable. If this first washing, for instance, is not sufficient, gold will be wasted, tones in gold may be uneven, and probably degraded. If a platinum bath is subsequently used, color may be bad; in any case, will be muddy.

If the washed prints are now fixed in the regular hypo bath of water ten parts, hypo one part, the prints are a really good red tone free from brickiness.

The above fixing bath is used for this paper always. It should be made up by weighing, used fresh, and not over-worked, at least ten ounces of crystals being used for each half-quire of paper. Keep prints moving for at least fifteen minutes, longer for a large batch. It is advisable to use two baths in the latter case. Thorough fixation is absolutely imperative.

Brown tones of various shades varying from red-brown to violet-brown, the latter rather novel, certainly quite pleasing, are obtained by toning in gold after the first wash.

Water 40 ounces Borax 80 grains Gold chloride . . . 2 grains

Make up just before commencing to wash. A few seconds in the solution will give reddy browns; chocolate and violet-brown extending to as long as five minutes. Chocolate-brown appears to be the simplest color to obtain and repeat, quite an amount of latitude being allowable. For platinum black tones obtained by gold toning followed by platinum bath the exact shade obtained in the former is of the highest importance. The resulting color depends entirely upon it and not at all on the platinum so long as the latter is used beyond a minimum time. To obtain pure steel grays prints should be taken out of the gold bath as soon as the red tinge leaves them. If removed too soon the results are browny-greeny-black, if gold toning is too prolonged the finished color will be blueblack.

Prints, gold-toned only, may be placed in hypo as soon as toned. Prints for duplicate toning must be very thoroughly washed for twenty minutes before being placed in the platinum bath. If this is not properly carried out toning will be slow, uneven, and wasteful, the platinum tending to deposit on dishes instead of prints. One minute spent on washing will be well repaid by quicker toning later. The reason for this is the fact that gold will only deposit on the silver image when in alkaline solution, while platinum must be in acid solution to tone. In other words, all trace of the alkaline gold bath must be removed or the acid platinum bath will not act properly.

After thorough washing, then, prints are ready

for the latter bath.

A good number of prints may be handled in this, for one cannot overtone. A new bath will act quickly. An exhausted bath is very slow, giving brown tones. Do not economize too much with the expensive chloroplatinite.

The used bath may be kept and used again, with the addition of fresh solution. Do not undertone; warm prints dry colder, but for the best results the prints should reach the desired color before being again washed. Important as the previous washings were, this is the most necessary since it is lack of thorough washing at this stage that is the main cause of unstable prints. All trace of the acid platinum must be removed before the photographs are put in hypo, otherwise the acid would react with the hypo. It is advisable to put a little stock borax solution into the last washing water, and also a little in the fixing-bath into which the prints must not be placed before they have received a full twenty minutes' careful hand-washing.

Prints treated as above have beautiful pure blacks that well repay this somewhat lengthy

manipulation.

Another method of securing black prints is to tone in the above platinum bath immediately after the first washing. A new platinum bath will give very good results. The least overdose of the bath, however, leads to dingy brownblacks; in any case, the whites are not quite so pure as those obtained by the double-bath method. If, however, one does not want blacks, but stops the toning much earlier, good browns can be got. Always wash thoroughly before fixing.

By far the finest browns are obtained by using an ammonia bath after the first washing:

Keep moving all the time. Stains are easily caused in this bath. Dishes must be irreproachably clean. Afterward wash for at least ten minutes to remove all trace of the alkali (ammonia) before placing in the acid platinum. A few seconds only in the latter gives a somewhat yellow sepia; longer, a beautiful warm sepia

resembling a warm sepia carbon, followed by sepia, then a distinctive brown sepia, later on a cold sepia, at last arriving at a warm black.

This method requires more care, perhaps, with dishes and handling than any of the others described, but the results are really beautiful—certainly the only ones to be compared with carbon or sepia platinotype, the color being really sepia rather than portrait brown given by the more usual methods.

by the more usual methods.

Treat as usual after platinum baths. All prints after fixation should be hand-washed for at least twenty minutes, and then in running water for not less than three hours. As running water is a hopelessly inefficient method a further handwash may be given with advantage.

Drying off should be done in a room free from any suspicion of chemical dust, preferably between clean blotting-paper. Foreign matter that would only stain the paper base of a platinum print would in all probability affect the image of these prints, which, while still wet, are

very easily harmed.

Throughout the fingers should be kept off the sensitive surface as much as possible, any trace of greasiness leaving red patches where the toning baths refuse to act. For good permanent results use pure chemicals, clean dishes, and wash, wash, wash. One fruitful source of impermanence used to be the mounts, this paper being peculiarly sensitive to influences that would have no apparent effect on other media. Dry mounting is a great safeguard, and we should advise its use entirely, or in default merely tipping the print on to the mount by the corners only.

This paper, owing to the variety of surfaces, thicknesses, and colors of paper, is particularly suitable for mask-out prints, more especially as in these styles the first cost of the paper is a consideration. The Japanese vellum, although tending somewhat to heavy waste on account of the delicacy with which it must be handled, is very satisfactory for high-class customers. One must be very careful to avoid creasing or rubbing at every stage. Owing to the great economy of time the tendency is to tone large batches. It will be found far more real economy in the end to keep the number of prints down and tone more frequently.

Cold Developer

A DEMONSTRATOR dropped into a studio recently and found the photographer intensifying the entire lot of negatives made and developed the day before. Naturally, the cause of weak negatives interested the demonstrator, for it is his business to keep the materials he demonstrates working up to standard.

strates working up to standard.

On asking the cause of the trouble, the photographer remarked that his developer had not been working as it should and he felt sure the developing agent was not up to standard or the plates were off quality. "I have a few plates to develop this morning," he said, "and you might see them go through."

The demonstrator halted operations long mough to get his thermometer into action, for

enough to get his thermometer into action, for the dark-room was quite cold. As he supposed, the temperature of the developer when ready for use was slightly over 50°, when it should have been 65°. Some hot water was placed in a large tray and the developing tray placed in this until the temperature reading was slightly above 65°. By the time the plates were developed the solution had dropped a few points and development was perfectly satisfactory.

The tips of your fingers will never take the place of a thermometer. If your hands are very cold, water at 55° will feel 65°. The wrist is more sensitive than the finger tips, but why guess when thermometers are so plentiful?

In the case mentioned an unexpected cold snap had so materially reduced the temperature of the water supply that the usual winter pre-cautions had been forgotten.

The results of developing at low temperatures are very likely to be encountered in tank development. If small plate tanks are used the developer may be made up and used without the fingers touching the solution or a thermometer being used. The air-tight tank acts, in a measure, as a thermos bottle and holds the temperature fairly even for the time of development. This is an advantage if the solution is at the proper temperature when the plates are placed in the tank, but a thermometer should be used to make sure that the developer is not below 65°, the normal developing temperature.

With large open tanks, maintaining the proper temperature is a more difficult problem. Photographers, as a rule, appreciate the importance of temperature, and in many cases where large tanks are used a water-jacket has been built around the tank. This permits one to fill the space between the jacket and the tank with hot water, and by so doing to keep the developer at the normal temperature.

If large tanks are not provided with waterjackets a glazed fire-brick or a stone may be heated and placed in the tank, or a jug of hot water suspended in the solution until the temperature has been raised to the desired point.

Negatives that are slightly too thin can be improved by drying quickly in a warm room with an electric fan, but it is best to secure the proper density by sufficient development in a solution of the correct temperature. As the rate of drying does have an effect upon density the greatest uniformity is secured by drying all negatives alike with an electric fan in a warm room.—Studio Light.

Outdoor Photography in Winter

Apart altogether from mere weather conditions, there is a difference in character between summer and winter subjects by reason of the changed face of Nature. Many trees, shrubs, and bushes are leafless, and there is a lack of flowers, ferns, and undergrowth generally. It does not follow that Nature in this garb has no attractions. Some winter phases are particularly charming, as witness the beautiful effects produced by hoarfrost or snow; and these are often particularly adapted to photographic expression, inasmuch as they are less dependent on color than are some of the summer effects, photographs of which are often disappointing.

But, in addition to this, winter has many charming atmospheric effects all its own. The light is milder, and contrasts are subdued and softened; details tend to become massed, and the picture is made up largely of delicate grada-tions of half-tone. The air is often misty, providing frequent opportunities for effects that are rarer in summer days; and even fog may be an aid to highly effective pictorial work.

An exposure meter is perhaps more useful in nter than in summer. The period of effective winter than in summer. light is much shorter, and the actinic power falls off with unusual rapidity toward the end of the short day. At times the light is unexpectedly powerful, and areas of snow possess a strong reflective power that must be taken into account. An important function of the meter is to decide whether a hand exposure is practicable. By actually testing the light—making the necessary allowance for the character of the subject, and ascertaining what is a fully adequate exposure according to the stop used and the speed of the plate or film—it can be decided whether the exposure is one that may safely be given in the

The increase both in the apertures of lenses and in the rapidity of plates and films has largely extended the possibilities of handcamera work in winter, and has brought within the limits of practicability a good deal of work in towns and with subjects where a certain amount of movement is going on, provided it be not too rapid. In favorable conditions it is thus possible to record many phases of winter sports with a hand-camera and a short exposure work that was formerly out of the question, at any rate if a well-graded negative was expected. But when the meter indicates that a hand exposure is impossible, there is a good deal to be done by using a tripod or other support for the camera, and so giving the longer exposure necessary. As a rule, a so-called hand-camera can be used in this way just as effectively as a fieldcamera. In the latter case, however, there is the undoubted advantage of being able to arrange and study the subject full size on the screen; and to use just the stop that gives the most effective definition, whether it be general or differential. An orthochromatic plate and a suitable color filter are often helpful with winter subjects; and here again the prolonged exposure entailed emphasizes the necessity for a stand.

One who has been accustomed only to bright weather photography may well form an entirely wrong estimate of the value of his negatives of winter subjects. As a rule, they do not—and should not—possess the same contrast and sparkle as those of the summer subjects. They may appear to him hopelessly soft and flat, when in reality they are just what they should be. The true test is to make a print. If this gives the effect desired, well and good; if it is really too dull and flat to suggest what was aimed at, then a vigorous paper will probably produce the extra contrast and vigor necessary. Occasionally a negative may be intensified with advantage. But it must be remembered that the object is often to render the subject in soft and delicate tones, and not to make a winter effect as nearly

as possible like a summer one.

A few suggestions have now been offered concerning certain forms of photographic work which are possible in winter. Reference has been made to architectural photography, especially indoors; to such a restricted line as the production of photographic silhouettes; to work indoors by various artificial lights; and now to

outdoor work.

In the space available it has been impossible to enter at length into practical details, and the object has been rather to suggest directions in which the photographer will find scope for effective and interesting work; leaving him to glean the necessary information and to acquire experience, and so arrive at success. Certain it is that the photographer who puts aside his camera for the winter not only "gets his hand out" but misses many golden opportunities that present themselves at no other season.—Photography.

Photomicrographs in Color¹

While the ordinary black-and-white lantern slide or print is quite satisfactory for the reproduction of the appearance of a diatom under a microscope, or for the specialized study of sections, it fails to give that appearance of reality which is so valuable when demonstrating the appearance of microscopic objects for teaching purposes. The student who is accustomed to the stained section under the microscope finds it difficult to recognize the appearance of the section when presented in monochrome, even when only one stain is present in the section. For the teaching of histology, entomology, pathology, and botany the use of lantern slides which resemble the original section in color is a great advantage. The only alternatives which give equally good results are the projection of the slide itself by a projection microscope, an operation which always presents considerable difficulty, or the use of a number of sections and microscopes, so that the students can examine the sections during or after the lecture.

The reproduction of stained sections in color is not nearly so difficult an operation as the photography of most natural objects in color. Great exactness of coloring is not necessary, it being only necessary to show the distinction between the different parts of the section as brought out by the counter-staining, and the bright stains are easier to reproduce by dyes than natural colors. Moreover, anyone who undertakes photomicrography will have a considerable amount of skill in manipulation, and any worker who can prepare stained sections must have experience in the use of dyes, so that it would seem that there should be a wider field for the application of color in photomicrography than in most other branches of photography.

Many sections will show on examination only one color, and in these cases only one negative is made, which is printed by the process to be described presently, and stained either with the same stain as that used for the section or with a suitable dye of the same color. Most sections,

¹ Communication No. 50 from the Research Laboratory of the Eastern Kodak Company. however, are stained with two different stains, and in this case two negatives are made through two suitable filters, and from these two colored slides are prepared and registered together face to face. In very difficult subjects, presenting a number of different colors, it may be necessary to make three negatives for the three-color process, and to print from these three positives, which are registered together. In practice, however, this is very rarely required, and one or two plates are all that are needed.

Let us take the two-color process as typical. The method of work is to choose filters which absorb one of the colors as much as possible and transmit the other, the two filters being necessarily complementary to the colors used for the stains, and, after making two negatives through these two filters, to make prints in bichromated gelatin and stain the prints from the negative in colors corresponding to the two

sections.

Thus, suppose a section is stained red and green. Make two negatives on panchromatic plates, one with a red filter, which will cause the green to appear as clear spaces in the negative and will not record the red, and the other with a green filter, which will cause the red to record and not the green. Then make prints from these in bichromated gelatin, staining the print from the red negative with the original green stain, and then that from the green negative with the original red stain, and superpose the prints. It will be found that lantern slides made in this way will reproduce the original appearance of the slide in a most satisfactory manner.

Making the Negatives

The filters required can be chosen from the set of M filters prepared by the Wratten and Wainwright division of the Eastman Kodak Company. These can be obtained either as gelatin film, in which case they should be protected from damp by the fingers by binding them up between two pieces of glass, or cemented between two sheets of white optical glass by means of Canada balsam, the cementing both protecting the filters and rendering them more transparent. The set includes the following filters:

Name o	f	
filter.	Visual color.	Spectral termination.
A	Scarlet	From 5800 to red end
В	Green	From 4600 to 6000
С	Blue-violet	From 4000 to 5100
D	Purple	From 3800 to 4600
	•	From 6400 to red end
E	Orange	From 5600 to red end
F	Pure red	From 6100 to red end
G	Strong yellow	From 5100 to red end
Н	Blue	From 4200 to 5400
K	Pale yellow	Luminosity screen for
	•	orthochromatic re-
		production with arti-
		ficial light.
		1101011 1181101

By using these filters in pairs the spectrum can be divided up into approximately monochromatic portions.

The choice of the filter for any section is,

of course, of critical importance. This is best decided by visual trial under the microscope, the filters chosen being those which most nearly absorb one color and transmit the other. A few examples may be of value: Photographing a section stained with Delafield's hematoxylin and precipitated eosin, the A filter shows no trace of the eosin and gives a good, strong negative of the hematoxylin. The B and C filters together record the eosin and hematoxylin both fully, and when positives are made and stained with a blue dye and a red dye the resulting slide will be excellent. For photographing methylene-blue and cosin, the F filter and B and C together give good results. With basic fuchsin and anilin blue the A and C filters are satisfactory.

The plates used are the Wratten panchromatic plates, the exposures when using the filters being determined by trial or by calculation, the factors for the Wratten filters being given in the booklet on "Photo-Micrography," published by the Kodak Company. There are, however, two points of importance in color work which do not apply to the same extent when single photographs are being made: One is that the illumination must be as even as possible and must not vary from exposure to exposure; the Nernst lamp is more satisfactory than an arc, though if the arc be carefully regulated its crater can be used with good results. Any unevenness between the two plates will result in a patchy appearance in the color slide. The second point is that the ratio of exposure for the two filters must be correct so that the two negatives show the same detail in the shadows of neutral portions of the section. It often seems difficult to judge of the correctness of the ratio in photomicrography, but every care must be taken to have the two negatives as much alike as possible. The exposure must be kept on the short side in order to secure transparent negatives, and for the printing process discussed hereafter a much softer negative must be made than for printing on paper or on lantern plates, so that the time of development should not be above two-thirds of that recommended for the plates for ordinary photography.

Printing

In the course of the experimental work done in the Research Laboratory upon this subject various methods of preparing the color pictures have been tried, including a number of those used in color photography, but the most satisfactory method was found to be printing on bichromated gelatin by arc light, the method being as follows:

Lantern plates (Seed or Standard lantern plates will be found satisfactory) are sensitized by bathing for five minutes in a 2.5 per cent. solution of ammonium bichromate containing 5 c.c. of 0.88 ammonia to a liter. The sensitizing may be done by artificial light, as the plates are practically insensitive when wet. The temperature of the bath must not be above 65° F., or reticulation of the gelatin is very likely to occur. The bath may be used repeatedly, but should be filtered before use.

The plates as they come from the sensitizing bath are rinsed for two or three seconds in clean

water to remove superfluous bichromate solution, and are then carefully drained in a rack until the whole surface is free from streaks, after which the backs are cleaned and drying hastened by a gentle current of dust-free air from a fan. The current of air must not be violent, otherwise streaks of uneven sensitiveness will occur. A gentle current of air which will dry the plates in about an hour is very satisfactory. Drying must take place in darkness or in a safe orange light.

The plates will remain good for several days if stored face-to-face in plate boxes.

Printing the Plates

The plates are exposed through the glass under a negative to the light of an arc lamp, the average exposure being about three minutes at eighteen inches' distance. It is sometimes convenient to use the arc in a projection lantern, removing the projection lens and exposing through the condenser, which must be clean. Either this or the naked arc is satisfactory, but the printing cannot be done by daylight, as when printing through the glass there will be

too much diffusion to give sharp images.

The plates are developed by rocking in trays of water at about 120° F. until all soluble gelatin is removed. Underexposure is indicated by the high-light detail washing away, and overexposure by the film being insoluble to too great a depth. The plates are next rinsed in cold water, fixed in acid hypo and washed free from the hypo; they are then ready for staining. Throughout the foregoing operations the deli-cate film must not be touched with anything other than liquids.

Staining

For staining, a 1 per cent. solution of dye is used containing 1 per cent. of acetic acid, the dye being selected to simulate most closely the original stain of the section. The time of dyeing is not important, but must be long enough to saturate the gelatin reliefs. The following are suggestions for the imitation of some of the best-known stains, though in slides made from two negatives the dyes must be selected so that in combination they most closely simulate the original section:

Stain.	Suggested dye.
Anilin blue	Pinatype blue F (Hoechst
Congo red	Naphthol red
Eosin	Eosin or naphthol red
Delafield's hema-	
toxylin	Water-soluble nigrosin
Basic fuchsin	Fast red B
Leishmann	Water-soluble nigrosin
Methylene-blue	
Picric acid	Chrysoidine S

These are regarded only as suggestions, and a little experimental work will soon show which dyes will give the best results. If necessary, a dye can be washed completely out in dilute ammonia and another dye tried.

When printing two-color slides from double

negatives, one of the negatives must be reversed, so that the film is toward the light; thus, we shall have in printing, first, the negative film, then the negative glass, then the glass of the lantern plate, and finally the positive bichromatized emulsion. In order to get sharp results either a condenser must be used or the arc must be a good distance away, but the reversal is necessary in order to be able to mount the dyed plates film to film to make the slide.

For slides for which the two colors are not sufficient the three-color process can be used, the three negatives being made through the A, B, and C filters, and positives from those made by the method described above, dyed, the one from the red-filter negative in Neptune green, the one from the green-filter negative in erythrosin, and the one from the blue-filter negative in any yellow dye, such as acid yellow, or, if the pinatype dyes are available, pinatype red, blue, and yellow may be used.

When mounting, the blue and red prints are mounted face-to-face, so that they are in contact, and the yellow print is mounted outside with its film in, so that the yellow film is separated from the red and blue films by one thickness of glass. The effect of this upon the differentiation will not be visible in a lantern.—C. E. K. Mees.

After-treatment of Negatives

DURING the winter months many photographers who do not care to face outdoor work, and are anxious to do a little photography as a relaxation from war worries, should turn their attention to the overhaul of their negatives, particularly those produced during the preceding summer and which still need a certain amount of after-treatment.

In these days when tank and time development is practised by so many workers, the number of negatives that needs chemical aftertreatment in the way of reduction or intensification is not so large as formerly, but at the same time there are always a few that will make better "printers" after a little attention of this

To begin with, sort out the negatives into four classes or groups: (1) Those which will require no treatment at all; (2) those which only require pinholes to be blocked out; (3) those to be intensified; and (4) those to be reduced. The reason for this classification is that it is practically no more trouble to make up an intensifier for a dozen negatives than to make it up for two or three; the same applies to reduction.

One is often advised to use potassium permanganate solution to ensure the complete absence of hypo in the film. The best hypo eliminator is water, and plenty of it. Give the plates a thorough washing after fixing, and then there will be no need to test for the presence of hypo afterward.

Let us treat of reduction first, as negatives taken in the summer in sunshine are more likely to be over-exposed than anything else, and correct development may have rendered them opaque and slow printing.

There are three methods of reduction: (1)

The ammonium persulphate method; (2) hypo

and ferricyanide; (3) local reduction by friction.

Taking the first method, the ammonium solution should be made of the strength 10 grains to an ounce of water. A similar volume of sodium sulphite solution should also be prepared-strength 20 grains per ounce of water. The negative should be put in a dish with enough persulphate solution to cover it. Rock the dish gently from time to time. Little bubbles appearing all over the negative show that reduction is taking place. When reduction has gone far enough, the negative is put into the sodium sulphite solution for four minutes, and then washed for an hour.

The potassium ferricyanide solution is a stock 10 per cent, solution. The reducer is made as follows:

Hypo solution (4 oz. hypo to a pint of water) $\frac{1}{2}$ OZ. Potassium ferricyanide (10 per cent. solution) . . . 20 min.

Reduction is rapid, so care must be taken not to let it go too far. Fresh solution must be mixed for each negative, as it does not keep

many minutes when made up.

The method of local reduction should only be employed with great delicacy. A tuft of cotton wool is moistened with methylated spirits, and the part to be reduced is rubbed gently with it. Rubbing must be gentle, or the reduction will be uneven. When the cotton wool becomes blackened it must be turned over. The black is the metallic silver which has been removed from the negative. This dodge is most useful for lightening negatives containing halated windows.

Intensification may be accomplished by means of mercuric chloride. The chief objections to this are its extremely poisonous nature and its aptness to cause reticulation. The solution should be one first saturated, and then diluted with four times its volume of water. If the solution is more dilute than this it will not matter greatly, as dilution only slows the intensifying effect. When the negatives have been bleached they should be well washed first in two baths of very dilute hydrochloric acid, then in four baths of clean water. To darken the bleached negatives a bath of dilute ammonia is used. The negatives should be left in the ammonia until the blackening is even all over, and until there is no doubt that the action has gone right through the film. The plate is then washed in four changes of water of three minutes each.

The chromium intensifier sold in tablet form ready for solution gives very good results, and the solution, if not used up, may be kept in a tightly stoppered bottle for a long time.

Pinholes can be stopped out by the extreme point of a sable brush very slightly moist with water-color of the right tint. Some dexterity is required for this operation, which can only be acquired by practice. It is therefore wise to begin on an easily spared negative.

Some alteration in negatives can be effected by the use of pencil on matt varnish, and other physical treatment, apart from ordinary retouching. For dealing with large masses of tone (either shadow or high light) the matt varnish method is hard to beat. This varnish (obtainable ready made from any dealer) is flowed carefully over the glass side of the negative (cold), and quickly produces a ground-glass effect. When quite hard it is obvious that the tage of high lights (the denset portions of the tone of high lights (the densest portions of the negative) can be lowered by scratching away the matt varnish with a sharp knife from behind the dense portions. In the same manner the shadows (clear parts of the negative) can be lightened by working on the varnish side of the negative with an ordinary lead-pencil or black chalk.

In this way a hard black-and-white negative that can be only partly assisted by chemical means will yield a good print. Care should be taken, however, to use a diffusing screen of tissue paper if printing in bromide or gaslight paper with direct light from a gas burner or electric bulb, otherwise evidences of the handwork on the negative will be visible. For the same reason a diffusing screen of ground-glass behind the negative should also be used when enlarging

from a retouched negative.

Another method of working up a negative, and one that will apply to the skilful oil or bromoil worker, is to bleach the negative in the ordinary bromoil bleacher, and then restore the image by pigmenting (bromoil itself is merely a form of physical development with pigment). As the image is being built up, the tones can be controlled to make the best of the picture, and it will be found that, when well done, not only is it possible to save many an otherwise hopeless negative, but a pleasing grain is introduced into the image that is not at all displeasing for some subjects.—Amateur Photographer.

Dead-black Varnishes for Photographic Woodwork

ONE of the most frequent needs of the photographer-especially if he (or she) takes a delight in making up pieces of apparatus, or, alternatively, in effecting small repairs—is a reliable recipe for a dead-black varnish.

The three following formulæ are recommended as being thoroughly practical; they entail very little trouble to compound, and are given with the hope that they may prove of assistance to

other workers.

		No	. 1		
Borax .					15 gr.
Glycerin					15 min.
Shellac					30 gr.
Water .					4 oz.

Boil these until thoroughly dissolved, and then add:

Nigrosine, W. S. 30 gr.

Dissolve sufficient celluloid (old film negatives cleaned off and cut into small shreds will answer admirably) in amyl acetate to form a stiff syrup. This should then be thinned with acetone, and enough lamp-black added to give the desired

color. When the first coating is dry upon the wood, a second coat may be given, should it appear necessary.

No. 3

Paint over the woodwork to be treated with a solution of-

Cupric							75 gr.
Potassi	un	ı bi	chro	oma	ıte		75 gr.
Water							$2\frac{1}{4}$ oz.

And directly the surface is quite dry, apply—

Aniline hydrochlorate Water $2\frac{1}{4}$ oz.

Wipe off any yellowish powder that forms. Repeat the process until the correct intensity of color is obtained, and finish off with a little boiled linseed oil, which should be gently rubbed into the wood.—Amateur Photographer,

A Waterproofing for Wood Dishes

For large-scale enlargements wooden dishes of adequate size are a great advantage, especially to workers who may not have met with complete success in developing, fixing, and toning, say a 24 by 18 bromide print, by the "brush" method. The chief difficulty in connection with wooden trays for this purpose is to make them thoroughly waterproof without going to considerable trouble, to say nothing of expense, in obtaining special materials. An efficient but easily made preparation can, however, be obtained by taking ordinary beeswax one part, and common brown resin four parts, and melting them together in an old metal pan. When quite liquid and thoroughly mixed, the compound should be poured over the whole of the surfaces it is desired to treat. The woodwork must be absolutely dry, and should be well warmed immediately before the resin wax is applied.—Amateur Photographer.

To Distinguish the Coated Side of Rough Bromide Paper

THE following tips are worth remembering: (1) Pass a pin through one corner of the sheet, and hold the pin horizontal while the sheet hangs free. We can then generally see a concave, curving-inward tendency of the coated side.
(2) Run a finger tip along the longer edge, and you can *feel* this curling-inward tendency. (3) Slightly curve the sheet longways, and look along the inside of the curve toward the darkroom lamp. Repeat with the other side of the paper: the coated side will look smoother than the plain side. (4) Touch the teeth with the tip of the tongue, then take one corner of the paper between the teeth, and hold it moderately firmly for say from half to one minute; slowly separate the teeth, when the coated side will cling to either the upper or lower teeth. If there is any doubt as to any one of these tests it should be confirmed or refuted by a second test. Trouble may often be saved by carefully noting once for all how the sheets are arranged in the package as it reaches you. For although different manufacturers differ inter se, yet the same firm puts up the same brand always in the same way.-Amateur Photographer.

Home Portraiture with a Tiny Camera

Now that home stands for so much to the many that are absent, home portraiture has gained fresh importance. For one may be sure that everything which will convey a sense of home and the home folk to someone will be fully welcomed by that someone "over there."

What of the little camera? There are many in use, for of late years it has been the fashion to possess one. From the cheapest to the most costly they all have their possibilities in this sphere. Perhaps they have hitherto been looked upon as being more suitable for chance snapshots on tour, interesting items that turn up at any time; but for portraits—"too small."

Not at all. The little camera holds, by optical

Not at all. The little camera holds, by optical principle and construction, the very possibilities that in many ways make for successful portraiture. Not least in this direction is the fact that it is a little camera, innocent and unassuming in its dimensions, so that the most nervous and difficult sitters will at times forget to become camera-conscious in its presence. And what a surprise when the result is quite natural, and will enlarge to a size quite imposing. The sitter will almost feel duped; but the end will surely justify the means.

In the little camera of modern make we may have a lens of large enough aperture for indoor portraits, and, owing to its short focus, with considerable depth of field. So that we can attempt difficult subjects, like children or portraits in a favorite corner of a room—which, alas! may often be badly lighted. At the same time the depth of field is valuable in securing groups with the figures naturally occupied somehow, at slightly different planes; this often gives a far more natural result than can be got when one has to bring them all to the same distance—a proceeding which is necessary with a large camera with a large aperture.

For another thing, a little camera is so easy to carry. Whenever I go on a visit I carry mine in my pocket, while my walking stick is convertible into a very good tripod. I do not do this to worry the friends upon whom I confer the doubtful favor of my visits, but to be

prepared.

Like Micawber, I ever wait for something to turn up. It may be a play of fancy lighting in the room; it may be a portrait which in after years will give more pleasure than the pain it gave in taking; or it may be illustrations for an article such as this, which brings cash to me and may help to put others on the track that I myself

have found so good.

Another advantage is the inexpensiveness of the plates; so that if every opportunity is taken to try for novel effects—subjects that require much experience and skill in judging light and shade, often in softening the one and brightening the other—invaluable experience may be gained at the cost of a few pence. Only the most successful results need be enlarged; and when an opportunity presents itself for a masterpiece picture we shall know how to proceed as regards lighting and exposure, the best use of the background and the accessories to hand in the room, experience in which must always contribute

largely to the success of "at home" portraits, whether the camera used for them is large or small.

Experience suggests the precautions to take and elements of trouble to avoid. If we work against the light—and we often do "at home"—then we should use a shade for the lens, and in all circumstances it is useful. The bright little anastigmats that are fitted to vest-pocket cameras really cover a considerable angle, which means that much light is thrown upon the bellows, some to be reflected on the plate unless a shade is used. A simple form of shade may be made of four triangular pieces of thin dark mount, joined together with passe-partout binding, and cut off at the apex just to fit over the lens, and this may be folded flat for the pocket.

Full exposure should be given. If we underexpose and try to "force" development, the negative will have a coarse grain, and its blank masses of shadow will look very awkward when enlarged. We should aim at a soft negative full of gradation. This will enlarge well, which is usually the ultimate aim, although, if the pictures are distinct and clear and printed on glossy paper or card, they will be quite effective printed by contact, and in some ways preferable

as "snapshots from home."

Sharpness must be the cardinal virtue of these little pictures; and for portraits and such near objects I do not think one can do better than focus on the ground glass screen, when the camera has one, using a magnifier for the purpose. Then one need not be concerned about the calculation of distance and the accuracy of the focussing scale—both factors which are liable to error.

The light is the great factor in home portraiture—to have enough of it properly diffused and in the right place. It must not be forgotten that daylight coming from the sky enters the window diagonally, so that really the best light is on the floor two or three feet from the window—not an unsuitable spot for children. The more we retreat from the window and the higher we go the less light we find.

Of course, we can often use artificial light, and a little pocket flash lamp is a great help where the daylight is weak or too harsh, while it does not add greatly to our kit. By means of the lamp, used with a little touch paper, we can get firelight effects at will, and for this it will be found best not to exclude the daylight entirely from the room but to utilize a little of it for the shadows.

I might continue to suggest settings for the sitters, but, as every home holds its own possibilities, I am sure it is best to leave that part of

the subject to the individual reader.

The few suggestions which have been made in this article will, I hope, serve as a general sort of guide in the direction indicated, and may lead some to realize the fuller possibilities of the little camera.—*Photography*.

Framing Photographs

From the point of view of the commercial maker and seller of photographs the passe-partout is not a very possible form of framing.

Unfortunately it looks as cheap as it is; it looks fragile, and in ordinary conditions passe-partout binding does not remain on the glass for an unlimited time. Unless a special mountant is used for it it is very liable to split away from the glass, and nothing looks worse than a ragged, shabby passe-partout, with bits of binding, in various stages of dilapidation, parting from it. No, from the commercial stand-point the frame which is saleable to a purchaser of portraits requires to be something more substantial, not to say of the right character and degree of ornamentation. Fortunately within the past few years there has been a great development as regards the design and production of frames suitable for mounted photographs of moderate size. For we may say at once that it is the small sized photograph which the photographer will most advantageously consider as regards supplying a frame for it. Apart from the fall in popularity among the more cultivated classes of enlarged portraits there are other considerations, such as cost and risk of transit, which make the supply of large frames a less satisfactory branch of business. There is, of course, still a good deal in it, but it is to the framing of the cabinet, panel, or boudoir photograph that the photographer advisedly devotes his attention at the present time.

Frame and Mount

One would like to say something about the style of the frame, but that is a difficult thing to do, apart from the mounting of the photograph. The two things require to be considered together. This is, in fact, a point which the photographer must make a great deal of, as it is quite right he should provide the customer with frames for his or her photographs. That is to say, by reason of its width or degree of ornamentation the frame should not destroy the scheme of mounting which the photographer has secured. doctrine is one which will not lead one very far astray. If you look round you will find that the effect of a framed portrait is most satisfactory where a narrow moulding and one of quiet, though it may be an elegant, pattern is used. I am speaking now, let me repeat, of photographs of comparatively small size, not of enlargements. But when we come to photographs which are framed close up—that is, without any mount between the print and the moulding, then a very much greater latitude is permissible in selecting moulding, of considerable depth, of quite an ornate character for the purpose of providing a fitting and effective surround for the print. Apart from this broad distinction it is not easy to say very much more which can be of direct guidance to the maker and seller of portraits. The choice of a frame, from the esthetic point of view, is governed by precisely the same considerations which guide one in the appropriate mounting of the print.

Damp at the Start

But something more than this requires to be said. There is a practical side to this question which largely is an esthetic one. We have to consider the best means to be taken in securing

or perhaps more correctly in sustaining, the permanence of the photograph in the frame. days gone by the framer, who usually was not the photographer, was the real culprit in the case where a photograph proved to fade or develop spots with the lapse of time. For a good deal of framing was done in the most desultory manner. The mounted print was placed on the glass, a sheet of cheap millboard laid on it, then two or three strips (which never fitted each other or the frame) of thin matchboard, and, finally, the framer made his scamped work look well by plastering on the back of the frame a wet piece of brown paper, pasted round the edge, to which, it is true, it stuck firmly when dry. The drying contracted the damped paper so that as regards outside appearance the job looked to have been well done. As a matter of fact, from the photographic stand-point, the job was done exceedingly badly. The millboard and matchboarding, just as likely as not, were damp, but if they weren't, the damped brown paper, used to form the back covering of the frame, provided quite a fair amount of moisture for the mount and the print itself to absorb. In other words, working in this way does just about as much as the framing operation can to favor the fading of the photograph.

To Keep the Print Dry

Proper and careful framing, on the other hand, such as framers of water-color paintings have customarily adopted, is not done in this slip-shod manner. In the first place, the picture and the glass are bound together with a narrow adhesive binding strip. In this way we get the first sealing of the photograph from the outside air, moisture and fumes to which in ordinary conditions it is liable to be exposed. The binding need be only an eighth of an inch or so on the glass so that it is concealed by the rebate of the frame. If thought well, it can be strengthened by giving it a touch all round with celluloid varnish, which makes the paper less permeable and also able to resist to some extent its wear and tear by friction with the frame. Some framers prefer to adopt a further refinement in thus binding glass and picture together; they place between the two a thin cardboard mask, or series of strips, around the edges of the glass, so as to keep the picture out of contact with the glass. The object of this is that in the event of moisture condensing on the glass as the result of variations in the temperature and humidity of the air, the print is preserved from contact with such damp. I don't know that there is very much in this plan, but it is certainly one which receives some support from the fact that it is largely used by framers of water-color paintings. Having thus performed the first stage of the framing process in this way, the next is to fit a one-piece backboard which shall fit closely within the rebate of the frame. If the size of the frame is considerable, then the backing-board may be in two or three sections, but they should be a tight fit with the frame and with each other, and the wood should be dry as a result of having been kept in a warm, well-ventilated shop for some time. Finally, the paper covering of the back should be attached with hot glue applied only to

the edges of the paper and to the back of the frame. The paper should not be wetted; on the other hand, pains should be taken that it is as dry as it can be made. The back of a frame may not look as well as one which has been fitted with a wet paper, but it is hardly to be supposed that anyone cares about the appearance on the reverse side.

To Separate from Damp Walls

A photograph framed in this way stands the best of chances of perpetual permanence. Provided that there is no inherent cause of failing in the print itself the subsequent effect of keeping, even in rooms which are not dry, is reduced to the minimum. There is a further preventive of access of damp which can be used, namely, the attachment to the lower side of the back of the frame of a couple of small studs which keep the frame, say, half an inch from the wall and thus allow a current of air to pass freely over the back of the frame, preventing the paper covering from accumulating moisture when hung on a damp wall. A couple of corks screwed into the frame answer quite well for this purpose. It is a simple matter to make the screw-holes for them and to leave the customer to fix them on when hanging the picture. Some year or two ago there was on the market-and may still be so far as I am awaresome little rubber cones for this particular purpose. They were supplied perforated, and with screws for fixing to the frame. Further than this, the shape of the cones allowed of them serving as supports for a second picture suspended below. In fact, a whole series of frames can be hung from one support in the wall by means of these very convenient cones.

Reframing Old Photographs

A word requires to be said on the framing of old photographs, such as Daguerreotypes and collodion positives. It must be borne in mind that the surfaces of these early specimens of photography are exceedingly delicate, and in reframing them the utmost care is required to ensure that the surface shall not come into contact with anything, but is held firmly fixed in the frame in the required position. The original framers of these portraits usually understood their business, and the careful examination of a framed portrait of this kind when removing the glass or copper plate will show the proper way in which to put it back. In doing this it should be borne in mind that some collodion positives are mounted film side to the front, while others are placed the other way about, being viewed through the glass. The slightest touch of the finger on the film side is capable of ruining these positives beyond chance of repair, and therefore the utmost care requires to be observed. Usually it is the colored collodion positives which are mounted film side to the front; the uncolored positives may be either way, but more often I think were mounted glass side to the front. The Daguerreotype (on copper) can, of course, be mounted only film-side to the front, but its surface is hardly less sensitive to damage by moist fingers than is the collodion positive. The image may not be so badly defaced—the collodion film sometimes will rub

right off the glass—but owners of these early photographs invariably place a very high sentimental value upon them, and any damage is the cause of annoying disputes. Commercially, there is nothing to be made out of these little jobs, and the photographer is, I think, well advised who declines them, except to oblige a customer or endeavors to induce his customer to have a permanent copy made.—British Journal of Photography.

Enlarging-With Limited Accommodations

The modern tendency toward small-sized cameras has made enlarging extremely popular. Every winter sees recruits to this fascinating phase of the hobby. However, many amateurs are deterred from commencing owing to the difficulty of suitable working accommodation. The purpose of this article is to show these workers how such an obstacle can be fairly easily overcome, and efficient working accomplished in a simple, comfortable, and highly satisfactory manner.

Purchasing an enlarger is the first consideration; in this case the amount spent will depend on the taste and on the pocket of the photographer. A few dishes and a measure practically complete the necessary equipment, except for one or two miscellaneous articles, such as dark-

room pins, etc.

The writer, in order to pursue his enlarging operations, commandeers the kitchen, which is usually left vacant during the evenings by the domestic authorities. The ordinary kitchen table is taken and found to answer exceedingly well as a bench.

At one end the enlarger is placed in such a position that it is square with the end of the table; this position should be determined so that it can be occupied every time enlarging is to be

done.

Two lengths of wood about $2\frac{1}{2}$ feet long by 1 inch wide and 1 inch thick are next required. These are fitted, in each, with two screw holes; they are screwed to the table about 6 inches apart, keeping them absolutely parallel, and also at right angles to the negative carrier of the enlarger. The idea is to provide a set of rails along which the enlarging easel can slide. Having found their position, holes should be bored in the table to receive the screws; small screws are quite sufficient, as it is only a temporary fixture, the rails being removed every time after enlarging.

It may be thought that objection will be offered to this apparent mutilation of the table, but really the required holes are very small, and a little explanation should allay any fear on the

part of the kitchen authorities.

Our next consideration was an easel, and this was simply constructed. An ordinary drawing board of good-sized dimensions was obtained and mounted on to a stout baseboard about 10 by 8 inches in size and $\frac{3}{4}$ inch thick; at the back two buttresses of similar wood were provided, and the whole fixed together by means of screws. On the base two strips of wood an inch wide and thick were fixed a suitable distance apart, so that they slid evenly but rather stiffly inside the rails of the table.

Care was taken to ensure that the easel and the negative carrier were parallel throughout.

Gas is the illuminant used, and a supply was obtained by means of a flexible metallic tubing connecting the enlarger pipe to a gas pendant above the table.

As the enlarger is fitted with an orange-glass window at the side, no dark-room lamp is needed; a small table arranged so that the light falls upon it does admirably for developing operations. The same light is quite sufficient for loading

and unloading the easel with the bromide paper.

Developing dishes were all home-made of wood and cardboard at a cost of practically nothing.—

Amateur Photographer.

Large-Focus Work with Small Cameras

For some time now improvements in reflex cameras and in lens construction have made the use of the hand camera with lenses of comparatively long focus very attractive to pictorial workers. It was with the object of gaining some practical experience in this direction, and at the same time adding a new interest to my occasional rambles about home, where I can work without risk of infringing the Defence of the Realm Regulations, that this year I fitted to my $3\frac{1}{2} \times 2\frac{1}{2}$ reflex a 9 in. f/5.4 Ross telecentric. This lens having a back focus of only $4\frac{5}{8}$ in., is exactly suited to the single extension of the $3\frac{1}{2} \times 2\frac{1}{2}$ size camera. Ordinarily, with this reflex, I use a 5 in. f/3.5 anastigmat, and the fact that my trials with the 9 in. were made in a district which I had frequently worked with the 5 in., and last year with a magazine camera of similar size fitted with a 4 in. lens, placed me in a favorable position for judging as to the superiority or otherwise of the telecentric.

At the outset, one of the first things I noticed with the long focus lens was the altered outlook which it gives. It is frequently assumed that any subject which may be obtained with a long focus may be obtained with one of shorter focus on a smaller scale and afterward enlarged; but in hand camera work with very small plates and lenses of short focus it is obvious that this method of working cannot be carried very far, and, as a rule, the hand camera worker gets into the habit of composing with the finder and selects compositions which will fill the plate with the lens he is using. What may be called long focus subjects are therefore passed over, and are often not even recognized until seen on the larger scale and isolated from their surroundings by the long focus lens.

Further, even if these subjects were taken with the shorter focus instrument and subsequently enlarged, it would probably be found that the picture lacked that gradual softening of the definition in the more distant planes upon which much of the charm of a landscape picture usually depends. For it must be remembered that when working with a 9 in. lens at f/5.4 we have greater power of selective focussing tham with a 5 in. lens at f/3.5, and f/3.5 itself is an aperture that is not often used.

The 9 inch telecentric lens greatly facilitates working against the sun, provided, of course, a ong hood or sky shade is fitted to the lens. The

hood may be of very considerable length, as may be seen by gradually extending it and noticing on the ground-glass the point at which it begins to cut off when the lens is pointed toward the sky.

Cloud subjects with such a long focus lens are limited to those which are not much above the skyline, of which this year the month of August gave us plenty. With a gray sky no screen is required; though, when working with rapid plates, I should use a screen even for a gray sky if I thought it desirable to increase contrast. For blue sky I use a five-times yellow screen, in order, of course, to correct the blue, and obtain sky and landscape of printing quality on the same plate. The telecentric, I think, helps in the use of the screen, as the longer focus permits the nearest shadows in the landscape to be more distant from the lens, so that they are not so likely to be under-exposed.

In portraiture the long focus lens is, of course, always superior, because it gives better drawing, with the possibility of larger and bolder treatment. This is recognized in the studio; but, in outdoor work, the long focus instrument has the additional advantage that it enables us to work at a sufficient distance to give uniformity of scale between the figure and the setting, and still to keep the figure of fair size and standing out well from the background. The evil of the short focus lens is that necessarily it includes a wide angle; this means that we are tempted to approach our figures too closely in order to get them of a fair size. To this cause is due the fact that so many pictures of children are seen to show the child as a sort of monstrosity compared with its surroundings—a result due, not only to lack of picture space perhaps, but to the figure being quite out of scale.

In the case of half-length figures, a very much nearer stand-point is permissible. For this reason an unsatisfactory full-length figure may often be trimmed to half-length or less and gained very much by the operation.

Natural groups, when they can be obtained with the long focus lens—and in the country I have usually found it possible to recede sufficiently to allow a lens of long focus to be used—will tend to be in better perspective, and the more distant stand-point is itself a great advantage. But in photographing moving groups in crowded markets, and especially in poorly lighted areas, as, e.g., in the streets of a mediæval town, a shorter focus and a larger aperture would, I think, be preferable. Some years ago I discarded a 6 in. f/4.5 for a 5 in. for this purpose when working with the same reflex. In the country, however, the conditions are different.

With regard to the difficulties of long focus work, the 9 in. at f/5.4 has, of course, very little depth of focus, and, as the back focus of the lens is short, focussing is naturally a delicate operation. I do not, however, think it more delicate than with a 6 in. lens at f/4. Certainly I have taken the camera out with the 9 in. lens one day and worked at f/5.4, and with a 6 in. lens the following day and worked at f/4.5, and have not observed any difference in this respect.

I use a tube magnifier of convenient length and of considerable power. This, I am aware, could not be conveniently used with the long hood usually fitted to the reflex camera, and is of little use in following a moving figure. In pictorial work, with moving figures, it is necessary not only to keep the figure in focus, but to consider the pose and lighting, and the exact relation of the figure to the setting at the moment of exposure. For these reasons there is a great deal to be said for set focus in this branch of

photography.

One cause of lack of fine definition in long focus reflex work must be sought in camera vibration and a few trials should be made with the camera on a stand and without the use of the mirror, in order to compare results. With some reflex cameras it is possible first to release the mirror and then to make the exposure with the blind. This method of work may be found useful in enabling a longer exposure to be given with less risk of vibration, and is one which is quite applicable to many classes of subject. A supplementary finder may be attached to the camera if it is felt to be necessary.

Another type of lens, which is not used as much as it should be in reflex work, is the portrait lens. The back focus of a 7 in or 8 in portrait lens is often only $5\frac{1}{2}$ in. to 6 in. Such a lens might be used, therefore, with the single extension of either a $3\frac{1}{2} \times 2\frac{1}{2}$ or quarter-plate reflex. (For a quarter-plate reflex, if the telecentric is to be used, it will be necessary, I think, to have one of not less than eleven inches focal length; as the quarter-plate reflex does not usually admit of a lens of shorter back focus than five to six

inches or thereabouts.)

The angle of fine definition given by the portrait lens is not great, but a good 7 in. or 8 in. Petzval portrait lens should give very fine definition indeed over a $3\frac{1}{2} \times 2\frac{1}{2}$ or half quarterplate, and would be much preferable, at any rate for outdoor or indoor genre work, to the shorter focus anastigmat, which is usually fitted to the reflex.

My experience with a 7 in. f/6 lens, having a back focus of $5\frac{1}{2}$ in., is altogether in favor of the portrait type over the assatigmat of shorter focus for this work. These lenses, however, vary greatly, not only as regards definition, but in weight and bulk. An old-fashioned Petzval lens may be very much larger and heavier than its effective aperture would suggest. It is therefore essential, in purchasing one, to note its weight, the diameter of the flange, and the back focus, as well as the effective aperture, which may well be f/5 or f/6, and also the area of fine definition which the lens will give with its full opening.—T. H. Greenall, in *Photography*.

Definition

When talking about "sharp" and "fuzzy," some reference should be made to the size of the picture, since a large picture would look quite sharp, although its definition is no better than that in a very fuzzy small one. In enlarging, there is necessarily a loss of sharpness, in one sense; yet if the enlarging is properly done, the enlargement will look just as sharp as the original small picture, when each in its turn is

regarded as a whole. In looking at the pictures the observer is sure to view the enlargement from a greater distance than he does the original.

Frilling; Blisters; Hardening Baths for Negatives

Although it is now comparatively seldom that we meet with blisters or frilling plates, yet now and again this trouble crops up in connection with variations in temperature in solutions and water. Practically we need only concern ourselves with three baths, viz., common alum, chrome alum, and formalin. This gives their order of merit, i. e., formalin being the most effective hardener. Alum bath: Water, 20 ounces; alum (common, i. e., potash), 1 ounce; citric acid, ¹/₄ ounce. An alumed plate when dry is less hygroscopic, and so less likely if unvarnished to be silver stained by printing paper in contact with it. Too strong a bath may induce leathery film, a kind of mottled appearance which is ineradicable. But per contra an alumed plate requires longer washing and is less sympathetic as regards such after-treatment as intensification or reduction. It is claimed that if the plate is alumed after developing and before fixing it will not show pyro stain. If this be done, fixing takes longer, and if the plate be not thoroughly washed between the alum and plain hypo fixing bath a deposit of sulphur will take place in the fixing bath and engender further trouble. The chrome alum bath is preferable to the common alum process. For this bath from 5 to 10 grains of chrome alum are dissolved in cold water. This is strong enough to harden a plate in ten minutes. Although the bath is colored, it imparts no color stain to the plate, but, on the contrary, tends to clear away stain. The *formalin bath* offers several advantages. One part commercial formalin in 20 parts water (i. e., 1 ounce per pint) is a strength to be recommended. plate should be in this for ten to fifteen minutes. Longer than this makes no difference. The plate can then be removed, rinsed a few seconds, surface dried, and then dried by artificial heat without fear of the gelatin melting. Formalin being a solution of a volatile gas requires very little in the way of washing.—Amateur Photographer.

Transparencies and Lantern Slides by the Ferro-prussiate Process

The following method of making transparencies and lantern slides may prove useful. In this case the blue color obtained is sometimes an advantage, particularly for moonlight and other night scenes. It also affords a method of utilizing old or fogged dry plates and lantern plates which might otherwise be thrown away. The silver is removed from the film in an ordinary fixing bath, or if an image has been developed, by using strong reducer so as to leave the glass coated with plain gelatin. (If necessary, plain glasses can be specially prepared by coating with a solution of gelatin.) After fixing, or reducing, the plate should be thoroughly washed. Sensitize in (A) Green ammonio citrate of iron, 15 drams; distilled water, 8 ounces. (B) Potassium ferri cyanide, 10 drams; distilled water, 8

ounces. Mix these solutions and filter. Sensitize by soaking in the mixture for five minutes; dry in dark, dustless place; expose under a negative, giving twice the time needed for a P. O. P. print. Develop simply by washing in water. Sensitizer should be freshly made. Plates will keep for some time if thoroughly dried and well packed face to face.—A mateur Photographer.

Enlarging without a Condenser

WE are often asked as to the use of enlarging apparatus with artificial light, but without a condenser. The condenser is an expensive item, and it is not always convenient to use one, even if it is available. It can be dispensed with for enlarging, if very great degrees of enlargement are not required and if the lens used works at a reasonably large aperture. The application of artificial light to the cheap fixed-focus daylight enlargers is difficult, because in these instru-ments the lens used is stopped down very greatly. It is made for use in daylight, where, the illumination being so very powerful, the extreme stopping down so far from being a drawback is an advantage, as it lengthens out the exposure until it is easily timed. When artificial light is used, this stopping down is often prohibitive. What the photographer can do, however, is to construct a fixed focus enlarger for himself, adapting it to take the lens from his hand camera which may work at f/6 or f/8; and with such an apparatus, enlarging two or three diameters, exposures by artificial light without a condenser become perfectly practical. The illuminator may take the form of a box, lined throughout inside with white paper. An aperture in one side of the box is arranged to come against the negative in the enlarger, and the side of the box opposite this aperture is covered with at least two thicknesses of plain white blotting paper. In the box, arranged to throw their light upon the blotting paper, but not directly upon the negative, may be two high-power electric incandescent lights or two incandescent gas lamps. The white paper reflecting the light makes quite an ideal illuminant, powerful and even, and exposures on bromide paper, unless the negatives are altogether too dense, do not exceed a few minutes' duration. It is advisable to ventilate the box, even if electric lamps are used.—Photography.

Celluloid Lacquer for Camera Brass-work

An excellent varnish, or lacquer, for the brass-work of a camera, enlarger, or other photographic apparatus can be made up to the following simple formula: Celluloid, 20 grains; acetone, 1 ounce; amyl alcohol, 1 ounce. The great advantage of this celluloid varnish is that it can be used "cold." The quantities given above would be sufficient for a considerable amount of work, as the coating only needs to be applied thinly; for the average amateur's requirements, half or even a quarter of the amount should prove ample. It may be added that this lacquer can be stored indefinitely in a well-stoppered bottle.—Amateur Photographer.

PATENT NEWS

Under this heading it is proposed to include each month a list of all the U.S. Patents; and brief abstracts of the more important, and to include also such foreign patents as present special features.

Copies of any patent can be obtained from the Commissioner of Patents, Washington, D. C.

Price, five cents each.

Panoramic Camera. Wm. F. Folmer. 1251494. Camera. Frank Green. 1251654. Focussing Attachment for Camera. Miles E.

Peterson. 1251690. Method of Preparing Photographic Film Cart-

ridges. H. Gindele. 1251766. utographic Camera. Percy Autographic 1251915.

Photographic Dark-room Lamps. F. W. Barnes and Geo. F. Phillips. 1252383. Camera. Alfred Moss.

Autographic 1252605.

Focusing Device. P. E. Young. 1252762. Film-signal for Cameras. Harry G. Mordaunt. 1253075.

Film-winding Device. Harry G. Mordaunt. 1253076.

Camera. Harry G. Mordaunt. 1253077. Color Cinematography. Percy D. Brewster.

In the art of color cinematography, the step comprising supporting in the same film gate two superposed sensitized films, receiving light from a colored object and projecting the same, part with an odd number of reflections to one side of the superposed films and part with an even number of reflections to the other side, to produce two separate images in suitable registry, an image on each film, and developing both films to produce negative color-records of the object photographed.

Light-splitting Device for Color Photography.

Percy D. Brewster. 1253138.
Finder for Camera. C. C. Carpenter. 1253144.
Film-shifting Device for Cameras. P. Brauner and L. W. Rosen. 1253205.
Moving Picture Camera. Wm. N. Selig.

1253285.

Device to Prevent Double Exposure in Cameras. O. H. Wilbur, Jr. 1253321.

Photographic Apparatus. Hy Van Hoevenberg. 1254013.

Machine for the Automatic Development of Photographic Plates and Films. Hinton J. Baker. 1254300.

Automatic Film-feed for Cameras. Guy E. Stansell. 1254313.

Camera-shutter Control. E. J. Hunt. 1254503. Indicia Device of Cameras. Wm. J. Gongawave. 1254590.

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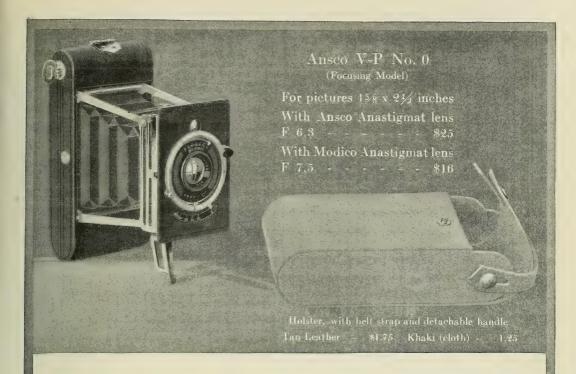
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THOMAS COKE WATKINS, Editor

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By J. M. B.

THERE is a kind of posing which is a very important subject for study and practice in the studio, but this is not the "posing" of the popular sense of the word. To explain: Light is the agency by which photographs are made; and to obtain light in quantity, quality, and distribution suitable for various persons and conditions, placing or posing of the subject is necessary.

Moreover, various special postures are suggested to the artist according to the type of his subject. For example, a too-fleshy person should not sit when having a portrait taken. I would even emphasize this kind of posing as an important and fundamental part of all

careful portraiture. But that "posing" as popularly understood is a subject of study by an artist is a serious mistake. As a matter of fact the very opposite is true. Nothing so constantly defeats the ends of an artist as this conscious effort on the part of his subject to pose. The effort is to transform and the result is always strained and unnatural.

To deliver a paradox—The most artistic pose is the most artless.

The artist's ideal is the normal presence of the person—the presence of the soul, if you please, and this is all he seeks. It is the joy both of his heart and his art. Unhappily it is constantly eluding him by the affectation of posing.

The soul (in so far as it is manifest) looks and speaks through the face. Therefore, anything that blurs the expression of character in the face defeats the artist. True, the expression of the body in every line should harmonize with that of the face.

The face, like the rose, is the center of an illumination whose glory is enhanced by the graceful support of stem and leaf, and if there is no restraint, from self-consciousness, the entire organism naturally falls into a harmonious whole. But the moment of an ostentatious pose or expression marks the end of harmony. What prompts these efforts against

(145)

which the artist has so incessantly to contend? Sometimes, as when manifest in dress, it evidently arises from a misapprehension of the elements of beauty. Sometimes it arises from an impression that the taking of a picture is a very serious business and depends for its success upon most strenuous efforts at self-transformation. This belief is more pronounced with the more thoughtless person, even ingenuous early youth is not exempt; for there we witness the unwise promptings of their elders.

Children are led to believe that they assume an awful personal responsibility in having their picture taken. Accordingly an artist often finds it an impossible task to obtain a good picture of a young child. He finds it impossible to dispel the self-consciousness resulting from the parents' careful drilling them for the ordeal. Johnny has been carefully dressed for the occasion, and is already quite uncomfortable, but on the way to the studio Johnny has been admonished not to soil his clothes nor muss his hair, for he is going to have his picture taken. And when he gets there he must sit perfectly still, and must do this and he must not do that. Finally his hair, which most naturally is not laid smoothly, has a finishing application of water and plastered to his head. All the natural kinks are thus taken out of Johnny, and he is sleek and trim. And do you suppose he is not conscious of the fact? And do you suppose you can keep his consciousness out of his face, out of his eye?

The common source of these affectations is vanity, and here as elsewhere vanity always defeats its own ends. Most men and women visit the studio hoping to give their friends an exaggerated estimate of their comeliness, little suspecting that this idea must find expression in the face and therefore is its own undoing.

In the matter of attire, little thought is given in most cases to conditions favorable to photography. The only concern about dress is that it appear rich in quality, stylish in design, and have the air of expensiveness.

And usually every feature of all this adds to the mountainous difficulties of the affectation and extravagance of the face. A man will wait for his new suit. A woman will wait until the new gown is finished before having a new portrait, never questioning as to whether some older gown would not be more suitable for the purpose. Indeed the new dress is often the incentive to have the picture—"the thing of supreme concern," and as a result little else gets into the picture. The dress gets its picture taken and the personality is a sacrifice to adornment.

Great advances have been made recently in general methods. For instance, the older school of photography placed a subject dressed in black against a white background, and *vice versa*. This produced hard, harsh, and cold statuesque results.

The new school aims at a soft, life-like appearance of the flesh. The old school reflected shadows up to the high-lights, giving harshness. The new school softens high-lights down to shadows, giving softness. The old school worked for extreme sharpness, the new to soften lines of definition. Observe how the newer method lends itself to simplicity, to the elimination of all that diverts from the face. By proper focussing all features of facial background they are softened and indeed everything is subdued and subordinated to the face.

As above stated, the artistic ideal is the expression of the personal presence in the illumination of the face. This is recognized by the modern school of photographic artists.

Concerning *form*: It is known to all students of art, that a natural and unconstrained form is infinitely superior to a studied one.

Of Expression: One author says the securing of proper expression is the great test and measure of ability in the fine arts. Portraiture to be fine art must bring out the peculiar marks of individuality—must bring out the *permanent* characteristics which indicate the disposition of the man or woman and which show the mind in the face.

This is possible to realize only with the unaffected, or at a moment when the mind is free from ostentatious expression. A statement from a distinguished art critic covering both form and expression: "The highest art is the imitation of the finest nature—the imitation of that which conveys the strongest sense of the

sublime and beautiful.

A List of Dont's.—Don't primp. Don't make of your hair such a spectacle that it attracts attention from your face. Don't color your face. Don't attract attention to jewelry. A wrinkled hand may be beautiful—one with a mass of metal and stones is not so. The consciousness that the rings are there is expressed in the face.

At the last meeting of the National Photographers' Association a photographer of national reputation related his experience with a subject which is only slightly more ludicrous than some of the daily experiences of every artist.

A woman past middle life had by some chance become suddenly wealthy. She applied at the studio for a sitting. One hand was heavily loaded with rings Upon learning the price she decided to look further. She soon returned, however, declaring that though his price was higher he made his subjects look better, and so she preferred to pay the difference. She sat, and as she did so persistently stuck up the ringed hand into great prominence. The artist finally asked her to dispose of the hand in some less offensive position. But she declined, saying that she thought she was paying him enough for the job so he could afford to take the rings too.

She had recognized the superior attractiveness of his work, but did not discern that the cause was in *elimination of inartistic features and insistence upon*

simplicity.

Don't go to the studio with the purpose of taking your own picture or with a feeling of serious responsibility in the matter. It is enough for you to do to bring your own true natural self there. Let the artist do the rest. Don't make a dummy of yourself upon which to display frills and baubles. Don't wear the new dress because it is new. Wear the one best suted for the purpose. In nine cases out of ten some older gown is better, even a very old one, for the new one is very likely to be stiff and intract-

able. Soft goods that falls into flowing lines are best. Not to startle you, your nightgown would be your best gown for a picture if it were drawn to approxi-

mate the lines of the figure.

Chicago social leaders are now wearing kimonas in the studio. The results, though by no means ideal, are an artistic revelation to themselves and their friends and a mighty relief to the artists. A plain gown, without distinct figure, and of such softness as to fall in uninterrupted, sweeping lines, following the figure from neck to feet, is most suitable.

Don't wear a linen shirt-waist, with long sleeves, stiff cuffs, and high neck stock. Don't visit a studio for a sitting when you are not feeling well or when you are tired or hungry. Upon entering a studio don't add gray hairs to the artist by telling him you had rather have a tooth pulled any time than have your picture taken, nor ask him if his camera Don't prepare a child's is insured. mind for the mysterious performance of picture-taking, but lead it unconsciously into the studio, where it may find diversion among toys and pictures. It is the artist's work to catch the opportunity, and the moment is when the child is itself and not a prompted statue, prim and primped.

Years ago I had an extreme illustration of this fault. A little boy had been especially well coached for the task. He was prepared to do his utmost to help the man out, and his efforts were indeed strenuous. I asked him to close his mouth and he sealed it with a pronounced pucker. "Not so tightly, my boy," I said, whereupon the mouth flew open to the limit. A painful case of

self-consciousness in a child.

The list of don'ts might be continued indefinitely, but the list of do's, though a short one, will make an extension of

the don't list unnecessary.

Concerning dress favorable to best photographic results: In case of doubt, consult the artist. Then, for your own sake, for your friends' sake (including the artist), bring your own true, artless, soulful self to the camera and you will not be disappointed.

A SPRING DRIVE FOR BUSINESS

The have been reading a great deal in the papers about von Hindenburg's forthcoming spring drive. He is said to have amassed an army of over one hundred and fifty divisions, something like 2,000,000 men, behind the lines on the Western front. Last year it was the Allies made the spring drive, and we heard the term the year before. Why is it all of these drives are planned for the spring? Is the spring a particularly desirable time for a drive? Superficially considered, you wouldn't think so. It is a time when melting snows make the bringing up of supplies difficult, when the trenches are ankledeep with water, the roads mere quagmires, and the engineering problems more than ordinarily difficult. Why a spring drive then? Isn't it largely for psychological reasons? Isn't it because, after a season of waiting, a drear season of inactivity when darkened skies and frigid temperatures put a damper on effort, both mind and body become restless and eager for action? I often think the term spring, applied to a coil of steel wire, had its origin in the consideration of its tendency to burst forth and stretch itself to the full (as it does in the case of a Jack-in-the-box), when released from a state of suppression, as everything does in the springtime when winter departs and all nature suddenly becomes active, as if touched with a fairy's wand.

The call of spring is irresistible. We have all felt its stimulus to activity. A rejuvenating, hopeful, everything-possible attitude possesses us then with the coming of warm, fair days and balmy weather. It is a time when we wonder why we ever sighed over anything and questioned whether life was worth living. It is easy to forget in the springtime to wipe the slate clean and begin anew. We fill our lungs with ozone and plunge into the fray freshened and ready for whatever may come. More than that, it is the time when we customarily loosen up our purse-strings a bit to gratify our vanities or advance our ideals. The house I planned to build I now start; the new auto is purchased;

the new bathroom is installed; a block of stock is bought as an investment. Temporarily we feel that our capital is inexhaustible (figuring in our latent possibilities), because our hopes are high and our energies quickened. And what cannot you buy with hope! A period of earning is approaching and the road is all ahead of us, nor do we deign to look back. We have balanced the previous year's account and feel that we can spend a little now if ever.

This time comes with the breaking up of winter, with the first sight of colorful skies, and the beck of warm, delightful days. The earth seems a kindly master then and we are willing to chance a little —to spend, and trust to Providence we may suffer no ill consequences. So there is a very good reason in human nature itself for a spring drive of any kind. You yourself are fresh and eager, aspiring, and ready for the contest of wits we call business; and the great public, more than at any other time except possibly at Christmas, will listen to a convincing message. Barring any effort on your part, business begins to pick up; the down-town shopping streets become thronged. People are glad to be released from their winter prisons, to be leg-free again. In cheerful, optimistic frame of mind they listen to the call of the most enterprising merchants. Like flowers, even merchandizing has its openings in the spring. It is the great coming-out time. Keep in tune with Nature.

In going after spring business the photographer does well to align himself with these rejuvenating forces—to recognize their character and direction and to keep his effort in accord with them. Freshen up the premises with new paint. There has been plenty of time for printing new samples that are fresh and clean: get them out. A few new fixtures will not come amiss. If you are going to put a new front on the building, now is the time to do it. Above all, the showwindows should be freshly trimmed, and the general background changed so as to seem new and interesting. People are charmed with the fairy-touch of spring

on everything, so that the bright, the fresh, the new engages them and is exspected. So let your place beckon to them by its appearance of newness. If you can find any novelties to exhibit. there is no time like this to exploit them. In your window-trims keep away from the commonplace. Keep away from the dull and ordinary. Make them interesting, if you have to put a model warship in as the center of attraction. Not that a warship is the best means of selling pictures, but it is infinitely better as an attention-getter than the merely humdrum. The public may have become so used to your ideal conventional display it has ceased to look. All live merchants sense the mood of the public at this time and clamor loudly for patronage by catering to it. If you are to get your share you must attract attention in competition with them. You cannot sell pictures until you have an interested public to sell to. Until people begin thinking of pictures they do not buythem.

If you are going to advertise, there is no better time to do it than in the spring. And advertising need not confine itself to printed circulars or display space. Whatever spreads the fact of the existence of your business and makes people think of your pictures is advertising. If you are located in a small city and your work is favorably known the local editor may welcome a feature page of pictures of the "kiddies." "The fairest flowers of spring" you might call it, or something of that sort. And if the youngsters are scions of the city's nobility, there is always sufficient public curiosity to make this a likeable feature. If the editor is kind enough to credit you in some way for the suggestion by such a phrase as "A page of 'kiddies' by Photographer Jones," the advertising value will be tremendous. But even if your name only appears beneath each picture it makes a splendid sample page of your work that will be seen by everybody and commented upon. And what an apt suggestion to parents it contains! Cannot you fancy many parents saying: "Aren't these cute? My, we ought to have Willie's picture taken before he gets any bigger. He'd look just as good as this boy." Then

would the fond father say: "As good? Say, Bill's got it all over that boy. Better have that done this week."

There you are!

The Eastman Company, it is said, is planning a National Photographic Week in May, to be featured with extensive National and local advertising. Everybody is going to be thinking of photographs at that time. Are you going to be ready to make them think of your photographs in particular? Are you going to advance the suggestion to them, ahead of time, that there is nothing like a photograph for a gift—made at Jones' studio? And there is Mothers' Day coming. What an excellent time to harp on oil-portraits! Are you going to open the suggestion for a "Father and Son" week, which is being fostered already in some cities? How much a father would value a portrait of himself and the boys! And it is so hard to get a man into the studio any way without a good pretext. And what time is there like the spring for the time-honored "Baby Week" or "Baby Day." Spring is symbolic of childhood. If you don't think these extra efforts pay when well generaled, just try them once.

If you have planned getting up a booklet to send out, there is no time like this for it. But don't send one out without an accompanying card, filled out by hand with the addressee's name, entitling the recipient to some concession or advantage if it is used before a definite date. By this means you make your carefully gotten-up booklet pay at once. booklet, you know, however nice it may be, is only an ad. to the one receiving it, and after it has been looked over will be thrown into the waste-basket and quickly forgotten. You will never know whether or not it impressed the patron. But by enclosing this card of inducement, the patron, if favorably impressed, is led to act at once while the matter is fresh in mind. You give him a particular incentive for acting, and will profit from the ad. at once if you are to profit at all. Of course a booklet has an influence in informing the patron, and he may act at some future time, but there is no time like the present. The blacksmith ham-

mers the iron when it is hot.

When all is said and done the watchword of spring is "hustle." It is the time when both buyer and seller are abounding with energy. It is an optimistic time and a good time to pick up new friends and extend your market. It is the time when, if ever, traditions, notions, convictions have the least weight and melt before the warming sun. It is a time for venturing, both by customer and tradesman. We accept a little more on faith at this season, and we listen hopefully to the call of novelty, to the urge of the stranger. What better

time then for a spring drive for business? We are in the thick of war, but business must go on. Let your motto be, not, "Business as usual," but "Business better than usual," for only as the country is prosperous and money is circulating, and all those not involved in the great fighting machine are contributing to the Nation's wealth, can we at home support this great destructive engine by buying the government's bonds and keeping its credit good. Start a spring drive for business today. Your country needs your money!

UNDER THE SKYLIGHT

By FELIX RAYMER

VE often hear the assertion made: "The principal thing in making pictures is to get a good negative; if that is all right the battle is won." But notwithstanding the fact that almost every photographer will agree in this, I am satisfied there are not 10 per cent. of them that really get their negatives right. Too often is it the case we leave something for the retoucher to do, or the printer, or perhaps the finisher. On particular features so many are lacking, as is the most important of all—the lighting. Of course, I know all make some lightings during a year's time that are good, some make more good lightings than others, and that very few indeed make half of their lightings what might really be called good.

The reason for this lack of good *uniform* work is largely due to the operator not fully understanding, not only his skylight, but the *floor space under his light*.

A light of a given size will admit just so much light, and the amount of space covered by this light in its fine strength is the amount of floor space available for making portraits or groups. When the operator steps out of this space he is handling a weakening light, that is, the farther outside this space he poses his subject the less control he has of his light, for the light is losing in strength

and the operator is really handling an "unknown quantity," so to speak. As long as he works within the limits of his light, or confines himself to the floor space covered by his light, it is merely a matter of close study on his part until he so familiarizes himself with every inch of that space that he will be able to tell exactly the effect of lighting he will get even before he seats his subject under the light.

It is this knowledge of the effects to

be secured by having the subject posed at certain stations, if I may be allowed the term, that secures uniformly good negatives. When this knowledge is acquired the operator will make as good work on Monday as on Tuesday or any other day. Until he does acquire this knowledge his negatives will be good one day, and bad the next and so on. In this series of articles, I expect to show different effects of lighting, on different subjects, and that I may be fully understood I shall make use of a small diagram which will appear at the head of each article. This diagram has the form and markings of an ordinary watch dial, and represents the floor space under any skylight. If one so desires, and I

think it a capital idea, he can have the

ring of the dial painted under his light,

although this is not absolutely necessary

if he can form the ring and markings in

his mind's eye.

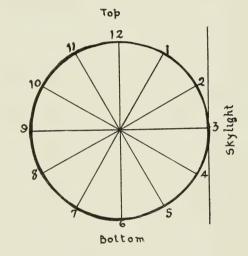
This ring should conform to the size of the light. If the light is ten feet square, the ring should be ten feet in diameter; if the light is sixteen feet square the ring should be sixteen feet in diameter. If the skylight is a single slant and is longer than it is in width, for example 10 x 14, the ring must be a compromise between the two, which would make it twelve feet in diameter. If the skylight is a double slant, treat it as though it were a single slant, measuring from the bottom of the sidelight clear up to the top of the skylight; then measure its width, and make the ring accordingly; for example, if the entire light measures twenty feet in length and fourteen feet in width, the diameter of the ring should be seventeen feet. This ring represents, as stated before, the floor space at the disposal of the operator. If he goes outside the ring he goes beyond the capacity of his light. I do not mean to say good work cannot be made outside this given floor space, for I have seen some exquisite work done in that manner, but it was made by a crack operator, and it must be remembered that such an operator will make good work anywhere and under all conditions. But these operators are few and far between. Hence I would suggest that the operator who does not feel perfectly sure of himself adopt this dial ring until he learns what every station will give him.

I also desire to call attention to the fact that this ring is in relation to the entire opening of the light; no curtains are to be used if this plan is followed. If curtains are used, they of course reduce the size of the light, and when that is done, the size of the ring must be reduced, as the floor space covered by light from a small light cannot be as good as by a

large one.

I now call attention to what is commonly known to operators as a plain lighting made in "three-quarter" view of the face. As I understand it a "three-quarter" view of the face is one where the ear on the side of the head farthest from the camera is just out of sight. Now to secure this effect of light and view of the face the subject should be

posed at station 11, and the camera at station 5. The subject should be turned toward the camera until the ear on the shadow side of the face is just on the point of coming into view from the camera; when this is done, every high light and every shadow will be in its proper place. The highest light will fall on the forehead and down over the nose, the next on the upper lip, then on the chin, and finally there will be a warm half tone or low high-light on the shadow side of the face; there will be a small spark of light in each eye, known as the catch light.



If a still broader effect is desired, but the same view of the face, move the subject to station 10 and the camera to station 4, and proceed as before. If a full broad flat effect is desired the subject should be at station 9 and the camera at 3.

It will be seen that the camera is always placed opposite the station occupied by the subject and this should be so where a "three-quarter" view of the face is to be made. For example, if the subject is at station 11 the camera is in a direct line opposite at station 5. If the subject is at station 10 the camera is moved in a direct line opposite at station 4, and so on for any of the stations. Now it may be that a strong contrasty effect is desired; if so, place the subject at station 12 and the camera of course

at 6, and follow instructions as given above. When the view of the face has been secured as directed, it will be noticed there is no "catch light" in the shadow eye, and very little or no light on the shadow cheek. It is the absence of this light on the cheek, and the catch light, that gives the contrast, due to there being a strong light on the light side of the face.

If a front view of the face is desired,

follow directions as given except to move the camera one station farther to the left or toward the shadow side of the figure. For example, place the subject at station 11 and have him turn to the light until the ear on the shadow side is about to come into view from station 5, when this is done move the camera to station 6 and a full front view will be obtained, but the lighting is of course the same as for the "three-quarter" view.

LANTERN SLIDE MAKING

By H. R. NEWTON

Some Selected Methods of Toning Lantern Slides.

A LANTERN slide of a black tone can have the color of its image changed by any of the toning processes which are applicable to gaslight or bromide prints. Toned slides are not so often made as toned prints, on account of the ease with which sepia and brown colors can be obtained by simple development; but for the warmer shades of brown, and for blue and green tones, separate toning is the more convenient.

There is a method of obtaining brown tones by development which may first be dealt with, as it may be regarded as a toning process. It has been suggested as a means of getting the warm tones usually obtained by the use of slow lantern plates, but with the rapid or black-tone plates. It presents no particular difficulty, and may at times be of service.

In this process a lantern slide of a plain black color is first made. It can be on a fast or slow lantern plate, the point is not material: and it should be kept rather on the thin side. It is developed, fixed, washed, and dried, and is then placed in an acidified bichromate solution until bleached right through, and then again well washed. The bleaching bath may consist of a $2\frac{1}{2}$ per cent. solution of potassium bichromate, to each ounce of

which twenty drops of pure hydrochloric acid have been added. After washing, all that has to be done is to redevelop the plate in a restrained developer, such as would be used for warm tones by direct development. The formula given previously will serve; or it may be modified by the addition of more carbonate and restrainer, so as to give a color still warmer. The warmer the color, the denser will be the resulting slide: so that for very warm tones it is important to start with a thin image. Development must be full, and can be carried on in white light; and there is no necessity to fix the plate again, although it is an advantage to use a weak solution of potassium metabisulphite or of acidified sodium sulphite as the first washing water, after the second development, to remove any chance of developer stain.

Sulphide toning will turn a black slide into a sepia one, and calls for little remark. The process is identical with that which is used in the case of prints. The direct or hypo-alum method can be used, the slide being left in the cold hypo-alum solution until it is toned, which will take from twenty-four to forty-eight hours, according to the prevailing temperature. There is no fear of overdoing the action.

Instead of this slow toning in the cold, we may use the hypo-alum solution hot. It will be necessary first to harden the gelatin of the lantern slide to prevent it melting in the hot liquid. Three or four minutes in a mixture of one part of commercial formaldehyde solution (formalin) to six parts of water will do this: and after a rinse or two, it can be placed

in the toning solution.

An enamelled iron saucepan makes a very suitable vessel for the purpose. It should be small enough to allow the slide to stand in it, leaning up against one side of the saucepan without risk of slipping The film side of the lantern down. plate should be underneath, and the toning bath, when poured in, should be cold. On an oil or gas stove the solution is gradually warmed up until it is just as hot as the fingers can bear, and no hotter, and it is kept at this temperature until the toning is complete, which will take about a quarter of an hour. The slide is then placed in a dish of water at about the same temperature and allowed to cool down. When it is cold, its surface is very gently rubbed with cotton wool, while it is still under water, to remove a slight deposit which is usually on the surface, it is rinsed under the tap or in two or three changes of water, and is finished.

The hypo-alum toning solution. whether it is to be used hot or cold, is of the same composition. It is made by dissolving 3 ounces of hypo and 120 grains of potash alum in a pint of boiling water. A thick precipitate gradually forms, which should be left with the solution, and before any is taken out, mixed up with it by shaking. One or two spoiled slides or bromide or gaslight prints should be put into the mixture, left for a day or two, and then taken out and thrown away: as, unless this is done, the bath will be found to reduce the contrast of the slides very much.

A very delicate effect, in the form of a bright red picture, can be got by applying a gold toning process to the sulphide toned slide just described. The toning bath may be made by dissolving 20 grains of ammonium sulphocyanide in 10 ounces of hot water, and, while it is still hot, adding a grain of gold chloride,

which may be in the form of the usual stock solution of 1 grain to the dram of water. The toning bath is ready as soon

as the solution is quite cold.

A whole series of tones from warm black through chocolate to a bright red is obtainable by the Ferguson method of copper toning. For this purpose the toner may be made up from 10 per cent. solutions of potassium ferricyanide potassium citrate, and copper sulphate, as required; or it can be prepared by dissolving in 10 ounces of water 45 grains of potassium ferricyanide, 1 ounce of neutral potassium citrate, and 55 grains of copper sulphate, in that order. When dissolved, the mixture, which should be quite free from any precipitate, is ready for use.

A black tone lantern slide placed momentarily in this bath is turned to one of warm black. If it is left longer it becomes a kind of reddish chocolate color, and longer still a bright red. There is very little intensification, if any, the tendency being for the slide to appear thinner, because its shadows are no longer black. After toning to the desired extent, the slide should be washed in running water for a minute or two, not more, and then dried. The toning will be found to give the gelatin a matt surface, and the brilliance of the toned slide is increased by varnishing.

Instead of copper ferrocyanide, we may tone the slide with uranium ferrocyanide in a similar manner. Any of the uranium toning formulæ can be used; that given by Blake Smith in his book "Toning Bromide Prints" has worked very well in the writer's hands. It gives a series of brown colors which are not so red as those given by copper, and are quite distinct in character from those

obtained by development.

The toning bath is made up by dissolving in 10 ounces of water the following chemicals in the order given: 7 grains of lead nitrate, 20 grains of potassium ferricyanide, 15 grains of uranium nitrate, 75 grains of citric acid, and 3 grains of ammonium chloride. Placed in this, the black tone slide speedily becomes of a warm color, passing eventually to a brick red. When the action has gone far enough, the slide is taken out and washed

for five minutes in three or four changes of very dilute acetic acid, and then for another five minutes in three or four changes of water. The acid may have a strength of half an ounce of strong acid to two quarts of water; and the washing given must not exceed that specified, or some of the uranium salt which has been deposited will dissolve away, and the color will go back toward its original tone.

For blue and blue-green lantern slides the plain black slide may be toned with iron. For this purpose 10 per cent. solutions of ammonio-citrate of iron and of potassium ferricyanide may be used, the working bath being made up by adding to 4 ounces of water 1 dram of glacial acetic acid and half an ounce of each of the two 10 per cent. solutions. The black tone slide is placed in this solution until the image has become a deep green-blue right through, and it is then taken out and washed in running water until the clear glass edges do not show any tint, but not for longer.

foregoing are the principal methods which have been advocated for toning lantern slides. There are others, but they are seldom used. At one time some professional slide makers used a gold toning method applied to slides developed to give a warm tone, the result being a brilliant blue-black: but, although such lantern slides sold very well, they were not of a kind to appeal to slide makers, being generally too bright and hard. In fact, as already indicated, no toning method has much vogue among the experts, the best of slides produced by toning hardly equalling the best that can be got by full exposure and restrained development.

Where lantern slides in colors other than sepia or warm brown are required, the carbon process seems to present great advantages over any modification of the image formed on a gelatin plate; but that lies outside the experience of the writer, and outside the scope of these articles, which here conclude.—*Photography*.

THE RECEPTIONIST

By "ONE"

If the pictures you are showing as samples of your work are of so little value to you that you throw them carelessly on the table, as if you were having a "job-lot sale," how can you expect to convince your customers that they are worthy of esteem,—and—a first-class price?

Every picture should be handled as carefully as you would handle the finest piece of hand-painted china: if a tissue is over the picture, be very careful it is not taken off until the customer has seen it, and then lift it off very gently, feeling confident you are showing something of which you are proud.

Go over your samples every morning, and see that they are clean and in perfect order; each kind being in the case to which it belongs. System is a great success to salesmanship. If you

have to hunt for a picture you want to show, your customer begins to feel an atmosphere of confusion, which is always a detriment to a sale. Wait on each one quickly, but do not rush them, always make them feel that their interest is your interest, and that they have your unlimited time.

If your samples are segregated, each size in a separate case, and each case divided into classes, such as ladies, gentlemen, children, and groups, can you not understand how easy it will be to put your hand on exactly the one required?

For instance, a customer calls, you

greet them with:

"How-do-you-do. Is there something

I can show you?"

That may sound ordinary, but if you smile sweet enough, and are gracious

in your manner, you are almost certain to get a "nibble on your bait."

They generally answer, "I was thinking of having my picture taken," and if it is a gentleman, nine times out of ten he will add, "I don't want to have it taken, but my wife insists on having one, so I suppose I must please her.'

But he is just as anxious about that picture as his wife. However, at this stage, it is quite necessary to assume a sympathetic expression, and assure him by your manner that you believe him and will do everything you can to make the ordeal as painless as possible. Then while he continues to tell you what force of character and the amount of persuasion it took to get him to consent to come, you have fully decided just what you are going to show him, and if your samples are in perfect order it takes only a second to hand him what you had in mind. Before he has a chance to get out he gives you an order for a sitting.

There is no set way to wait on every customer, every one must be attended to according to their own individuality, and let me assure you that is "some individuality" with "some people;" but, if our work was all as easy as counting our fingers and toes it would be valueless. and therefore we could not demand a

good salary.

Do not be afraid of work: never be "asleep at the switch": and under no circumstances ever have a "chip on your shoulder," if you should notice one on the shoulder of your customer be clever enough not to touch it.

That reminds me of a disagreeable woman who came to the studio a few weeks ago. She wanted a group taken of her two small daughters and herself. You, who have waited on over-indulgent mothers, will know that their children are the only ones ever brought into the studio "with such beautiful eyes, and such marvelous coloring that they ought to make a wonderful photograph;' such were the words of this particular woman; she certainly was an exaggeration of the rule. But, when she brought those children in,—well,—I was not looking at them through the mother's eyes, and so must be excused if my opinion was quite the reverse. My

sympathy immediately went out to the operator; I had given him a vivid description of his "subjects-to-be" so he did his best work in posing, lighting, and expression, hopelessly endeavoring to please her; but she was cross, irritable and faultfinding: "Peggie, dear, had not assumed her brightest expression. Oh, did you take that? I know it will not be good.'

At last after several exposures, the operator, thoroughly exhausted, exclaimed: "That is all; we will have

your proofs tomorrow."

And with one last fling, "I know they will not be good, I am not at all satisfied," she flounced out of the skylight room, donned her wraps, and switched through the reception room, passing me by as if I was a wooden image standing there, mechanically wound up for the occasion, to smile and bow as she

passed.

The door closed and she was gone. The current was turned off, and I stopped bowing and smiling. A sign of relief burst from my breast. I looked around at the operator, who still had enough strength left to peek around the corner. We knowingly winked at one another, and said almost in unison: "Thank goodness she is gone." The next day she called for her proofs. and in the most benevolent guise I smiled sweetly and handed them to her.

She looked at me in amazement as much as to say: "Are you still trying

to please me?'

She looked at the proofs, but I noticed she glanced at me occasionally; finally her manner changed as if she would like to atone for her rudeness, and I quickly observed she began to "warm up" to the proofs, even though her first remark had been, "Horrid-I knew they would be." I never spoke until she had looked at every one, and then I began:

"I like your proofs very much; Mary-Ann's eyes are wonderful in this picture, and what a sweet expression Peggy-Jane has; this is a very graceful pose of yourself, did you notice the

beautiful lines of the figure?"

Very few women can resist compliments, or men either for that matter.

Well, I sold her a very liberal order on those proofs, and when the pictures were finished and delivered to her she was delighted with them. In one of her calls at the studio, she admitted that she was conscious of a very disagreeable disposition, but that we had been so patient with her she really felt ashamed.

We might sum it up like this:

A rod of determination, A line on human nature, A reel of self-assurance,

A hook of a gracious manner, baited with pleasant smiles, thrown into a business stream, will catch a "fish" unawares.

This is only one incident, but the old saying: "You can do more with sugar than you can with vinegar," is true in most cases.

FIVE TOWNS AND A PHOTOGRAPHER

In the spring of last year, E. F. Martin left his studio in Eugene, Oregon, a town of 10,000 inhabitants, where he lived in dignity and ease but in no special affluence, because he had five competitors—quit being a divisor in the picture dividend of that pleasant town and became an itinerant camera man, a photographic troubadour.

He went scouting for a new location and he did not have to scout long. the adjoining county to the south he found a village of 500 people without a photographer; six miles farther south was another village, of 300, also sans studio: southward from this fourteen miles 600 people lived together without anyone to take their pictures; and three miles over a mountain, in a valley of apple trees, was a fourth village, of 500 people, with nobody to point a camera at them. Still the sequence was not ended. The next town in line was the county-seat with studios aplenty, but fifteen miles beyond was the fifth place in the series, a town of 400 people, like the rest, without a picture gallery.

This looked good to E. F. Martin. He settled, not in one of the towns but in all five of them. He put up five shingles, and in the last month of the year, which was a fourth gone before he began it, he made only a little less than \$500. He does not always make that much in thirty days. December was a good month. From \$100 to \$500—between this minimum and this maximum ranges his monthly income, and this in a field that has lain unseen and deserted for a dozen years.

Ten to fifteen years ago each of these small Oregon towns had its studio. The photographer was as certain a presence in the village as the merchant, the teacher, the dentist, the doctor and the preacher. His profession was as essential as theirs; he filled as definite a need as they; without him the community was incomplete. In plush albums in thousands of homes are the pictures, the taking of which meant a livelihood to him and his family. On the heavy, slightly concave mountings are the gilded stamps of his name.

But where is he now? He and his brother photographers have left the small towns in a mighty exodus. New economic conditions drove him out. When the drugstores began to sell cameras and films, when the secrets of his art were spread abroad in a universal promulgation, he picked up his traps and left, and the skylight of his studio became festooned with cobwebs. Some business remained but not enough to

make him a living.

The small-town photographer of those days was, if anything, an artist. He was no business man. With the advent of the individual camera the world sank under his feet. It never occurred to him that by joining several of these towns together he could still make money. From a thousand villages there was a migration of photographers and no one came to take their place. Some of the business that remained went to the county-seat, but much of it ceased to be done. Like the buffalo, the village photographer became an extinct species.

Not one of them had the business prescience to see that by combining the diminished and abandoned patronage of several of his brothers he could secure a volume of trade sufficient to yield a good income. It remained for E. F. Martin to come along, look over those five towns and catch the vision.

In this quintet of towns E. F. Martin gathered up the business that had gone to sleep for lack of somebody to take care of it, got back the county-seat patronage and exploited many new fields practically unknown to the village photographer of former days. In the long interregnum, since the older photographer had left, these potential fields had sprung up and only waited an

aggressive man to occupy them.

E. F. Martin does not make much from any one source. It is the multitude of his sources, always multiplied by five, that gives this nomadic photographer a handsome income. By its very extensiveness he makes the tattered remnants of the old conventional patronage yield in a substantial way; and to this, which comes almost inevitably, he adds a lot of new business which is the reward of exploitation and his own wideawakeness, and in a manner the result of the same new economic conditions that sent the ancient photographers cluttering.

The high schools of the towns are good patrons. High-school annuals create a demand for many pictures. The graduates, of course, have their pictures taken. The teachers' training classes increase the demand further. The members of these classes send out photographs with their applications to school boards. The graduating picture is fluffy and artistic; these pictures are more severe and business-like. The same picture will not serve both purposes. The orchestra, the dramatic club, the debating team, the athletic association, these and many other school organizations all have need of many photographs. Five high-schools thus taken together offer a liberal patronage.

The commercial clubs are another source. Salem, Oregon (that asked Salem, Massachusetts, to change its name), is typical of the aggressive spirit

of Oregon municipalities, down to the humblest village. These five towns, in the bulletins advertising their resources, frequently call on the photographer and give him a neat bit of business in the course of the year.

Pictures for newspapers are another source that E. F. Martin does not neglect. He can furnish five local correspondents with pictures or send them directly to the Portland papers at still better prices. These are supplemented by occasional pictures to firms for advertising purposes and to magazines. The Oregon country is picturesque enough to make this an important source.

Local post-card views, at five cents apiece, placed on sale in the drugstores of the five towns, amount up in the

course of a year.

Local merchants like to see pictures of themselves or their business establishments on the screen. This kind of advertising is contagious. The local movie man is always willing to coöperate, so that lantern slides are a new and cumulative source of income.

He cooperates with the local newspaper in urging the farmers to use letter-heads. The newspaper man does the printing and the photographer shows the farmer the advantage of having a cut of his ranch to decorate the head.

He also coöperates with the furniture dealer in enlarging and coloring photographs of old mills and picturesque local scenes. The furniture dealer frames them. Many parlors have a liking for such decorations. It is a liking easily popularized, and the photographer can go into the work with conviction, for such pictures are much better for the parlor than the enlarged and gilded-framed picture of grandma or grandpa.

The real estate dealers are good patrons. E. F. Martin caters to this trade particularly. Nothing will sell a house or farm like pictures properly taken. As the country is new, real estate is constantly changing hands, and as sales are frequently "sight unseen" to Eastern people, pictures play an especially important part in the trans-

actions.

Every picnic or gala day yields him



A WINTER LANDSCAPE IN UPPER ENGADINE. BY ALBERT STEINER, ST. MORITZ

a profit. People who are in the mood for pink lemonade are also in the mood for pictures. E. F. Martin is accordingly on hand with his camera.

Two of these towns annually hold six-day chautauquas. He is present in those particular towns during this week with offers of special rates. He consequently does a land-office business. For a good while afterward he steals time from his sleep to develop and print.

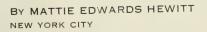
When he leaves town he generally puts a sign like this on his door: "Gone to Myrtle Creek. Will be back May 15." When he returns he finds a lot of business waiting for him. It will wait, too. "I guess I am all right in that town now," he said, in speaking of one place. "They think nobody can take pictures down there but me." This is the attitude which, by the quality of his work, he has created in all the five towns.

He keeps a photographic record of everything that goes on in five communities. He keeps his eyes open; no potential picture escapes his observa-

tion. Is there a new baby born? A letter of congratulation to the parents, with a suggestion that in after years they would value a picture of the little fellow, usually results in an order. Is there a marriage? You are all familiar with the rural bride, in wedding dress and veil, with her hand resting possessingly on the shoulder of the young man, who faces straight ahead with a look of conscious pride. Mr. Martin, believing that it is his essential business to please, is willing to subordinate composition to the receipt of jingling dollars, and on occasion-many occasions—to take pictures like this. Commercial art must have flexibility.

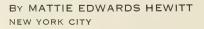
Are these five towns the only places without a photographer? Are they not everywhere, in every State, in convenient sequence along a railroad, beckoning the photographer to come—the unseeing photographer with his back turned on real opportunity while he puts up a shingle in a large town already sadly overshingled?





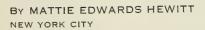


















BY MATTIE EDWARDS HEWITT NEW YORK CITY







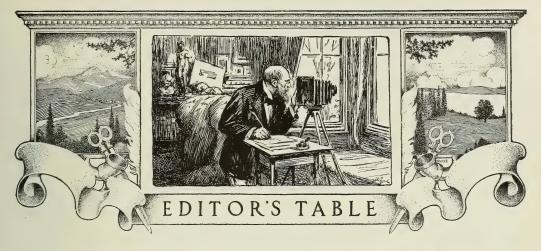
BY MATTIE EDWARDS HEWITT NEW YORK CITY





MATTIE EDWARDS HEWITT BY THE GERHARD SISTERS ST. LOUIS, MO. (SEE EDITORIAL)





"CAN I AFFORD TO ADVERTISE?"

THIS is a question that a great many photographers today are asking themselves, and in far too many cases for their own good are answering it in the negative without investigation. No matter how small the gallery may be, if it is doing a business that supports its proprietor without advertising, it can, with the right kind of advertising, be made to bring in a very considerable increase of business during the next twelve months.

The word "advertising" seems to scare a great many men who would profit greatly by looking into the matter before dismissing it. Advertising in its true sense does not mean, of necessity, an expensive campaign of literature, newspaper space, periodical publications or matter of that kind, but properly embraces all efforts by which a knowledge of the existence of the studio may be brought to the attention of the people of a community, their interest focussed upon it, and the thought created in their minds that its products are more necessary to their welfare and happiness than they had believed to be the case.

In many of the larger towns and cities, photographers with a large population to draw from have long realized the value of publicity matter and advantage of working along some definite line of advertising, without which they would hardly deem it possible to carry on the business today. In the smaller towns,

where the population is limited and where the buying interest of the community has never been aroused to the purchase of goods other than those deemed necessary for the comforts of life, the case is different and the photographer located in a community of this kind naturally shies at a proposition which involves the expenditure of any considerable amount of money without a definite and absolute certainty of proper returns. It is nevertheless a fact that, even in such communities as these, the photographer can inaugurate some sort of a publicity method by which in the course of time his business should profit materially. It is, however, in most cases a fatal mistake to imagine that the expenditure of a few dollars for leaflets, folders, follow-up letters, or anything of that kind, even including newspaper advertising, will be of any material value in adding to the business of the studio unless the campaign be carried on with persistence and upon lines that are well thought out and carefully planned.

The money that may be spent for a spasmodic dive into publicity by which the advertiser makes what to him is a tremendous splurge, but what to the public scarcely creates a ripple in the tide of their interest or enthusiasm, he may better devote to the purchase of a box of cigars or other luxury and get the enjoyment of them himself. There are many lines of publicity that may be opened up in the smaller studios without the expenditure of a cent for printed

matter of any kind, and at this season of the year it behooves the ambitious man to get busy and work out the problem for himself. If he has a studio register that contains any considerable number of names, let him go carefully over it for the past four or five years. Let him pick out the names of patrons who have not been in his studio for a considerable length of time—it is safe to assume that he will find many such—and let him, during the spare time that he would otherwise employ in waiting for the customer to come in, sit down and write a few lines to the customer, reminding him of the time that has elapsed since the last negatives were made in the studio. Let him mail this letter under a three-cent stamp and await results. If none are in evidence during the following two or three weeks, let him repeat the dose, using a little different phraseology, but at the same time dwelling upon his desire to show them something new in the line of portraiture or to bring to their attention some special line of printing or other special line of his studio which he believes would particularly interest them.

There is an endless field of possibility in the studio register of almost every photographic establishment in the country and it has never been half-worked. If the proprietor of the studio does not feel competent to work out the problem of framing and phrasing such a letter, let him ask help of someone who can help him. There are plenty to whom he can apply and he need not be at any considerable expense in the matter, either.

If he wishes to reach a larger circle of possible buyers, let him prepare or have prepared a neat, attractive, but inexpensive folder or leaflet, which may be mailed under a one-cent stamp, and let it be followed by another or a personally written letter a little later on. In any event let him assure himself at the start that whatever course he undertakes must be persisted in for a reasonable length of time if he is to expect any considerable return.

One thing may be taken as a selfevident proposition, namely, that if the establishment has been kept going without any effort of this sort, the right kind of effort will materially increase the returns.

It is also evident that if the returns can be increased in this way, the percentage of profit arising from increase of business will be very much greater than that resulting from the business as carried on under the old method. There are few galleries in the land that cannot handle a large proportion of new business, in addition to that which they are already turning out, without any material increase of outlay over and above that necessary for the purchase of stock and material. It follows, therefore, that every new order resulting from this increased effort brings a larger proportion of profit to the studio than any single order for the same amount that may have been taken without it.

There are, too, in every community, opportunities for special work in the photographic studio that ought to be put to very much greater use than they are at the present time, or ever have been.

The studio, with its outfit of more or less expensive apparatus, ought to be made to pay back its cost every year in the commercial work outside the studio limitations. If the rank and file of the craft in this country would see the possibilities that lie dormant in the field of commercial photography, and avail themselves of them, there would be far fewer causes for complaint about dull business than there are today. None of these possibilities, however, will develop themselves. The studio having an outfit to do the work and an operator with a fair amount of ability and ambition may find them, if it will push out into the surrounding field and acquaint the public with its existence. There is no better demonstration of this statement needed than the experience that is coming under the eyes of photographers everywhere in connection with the amateur worker, who, despite the handicap of inexperience and poor facilities, is in many cases taking work out of the hands of the professional photographers and is getting from it, in some cases, prices higher than the ordinary photographer would dare to charge for the work produced.

It is not necessary in such work as this to go into expensive advertising, but persistence is a necessity of the utmost

importance.

As the spring season opens, and bettering conditions of light and possibilities of outdoor work may be expected, the photographer is urged to arouse himself from his lethargic conditions and to reach out after more business—business of the kind that will pay and help to support his studio. There is far more of it to be had in the land than the most sanguine photographer can imagine. It must, however, be gone after and by a persistent campaign of personal letters, printed matter, or other kind of effort that brings the photographer frequently in touch with the public at large. After this campaign has been in operation for a reasonable time an appetite will have been created for work of this nature which in the beginning of the campaign may not even exist.

Like all other luxuries it is necessary to educate the public to a desire for the goods advertised before the full returns from an advertising campaign of any extent may ever be reasonably expected.

VALUES IN PORTRAITURE

N studying a picture we are apt to isolate the different parts of it and so direct our attention to them individually; so much so that we often forget the relative tone of the whole picture. If we should construct our picture with only due regard to the individual forms, however much we might obey the laws of composition as regards balancing of lines, our production would be apt to present a very flat appearance; one part would not stand out against the others. So there ought always to be a balance of the masses in a picture as well as linear symmetry, and though it is almost impossible for the photographer to fall into the mistake of the pre-Raphaelite who perceived nothing of the value one object bears to another in the scheme of composition, yet there is danger, especially where the photographer has control of his subject, as in very many genre groups (not of Nature's making), of reversing the values and producing the very opposite of effective-The modern tendency of artists ness.

on values is in the direction of less contrast than would have been accounted as proper thirty or forty years back; that is, the values are more delicately managed, especially in portraiture. There is seldom seen in modern portrait painting that great contrast which was deemed necessary at one time between backgrounds and head or figure study. The black of the dress of a lady, for instance, is not relieved by white lace trimmings, and the whole set against a gray ground to bring it out in relief, but painters nowadays prefer the ground but a very little lighter in tone than the drapery of the figure. To do this skilfully demands much tact to give any simulation of atmosphere between the figure and the ground and prevent a mosaic-like effect. But when skilfully accomplished it certainly has a peculiar charm of delicacy and lightness. In photography these delicate values are hard to manage, since the operator has not, like the painter, color to aid him in selection of scale of tone, and so it is that those who affect delicate values more frequently present smudge and flatness; but when secured, the photographs are as pleasing as paintings. We were recently looking at some very beautiful photographs of snow and ice, where we have white on white, in which the values were delicately preserved. A mass of snow in one picture was relieved against another mass of snow, but slightly differentiated from it in tone, but the effect was beautiful. The snow, practically speaking, was all equally white in nature, but the photographic artist in managing the values, contrived that there should be a difference in intensity between the broken masses of snow and the main body, and so secured a delicacy of relief without offending by heavy, unmeaning shadows and glaring, intense high-lights. We thought photographers might here take a lesson in associating white drapery with light background, but a photographer who believes that the soul of photography is in what he calls brilliancy of effect would have been afraid of producing a flat-looking picture. and perhaps the majority of us would have gotten a too tame-looking study.

The study of values requires a great

deal of practice of the eye, but it is a study we ought not to neglect, since values are the only means of artistically representing things.

THE "REAL THING" IN THE PICTURE

SPEAKING before a gathering of professional photographers, one of our best known photographers made the remark that "you can get composition and all those things from a dry book, but I want you to get at the real thing in the picture." Unfortunately for his hearers, the speaker did not define the "real thing" in the picture. We are not denying its existence, and acknowledge the difficulty of defining it.

Granting the soundness of the advice, to get at the "real thing" in the picture, we take exception to the implied inference that it is something not to be learned from dry books, like "composi-

tion and all those things.'

The "real thing" in a picture is that undefinable something that arrests and holds our attention. The most uncultured and inartistic people are stirred to admiration at the "real thing," as shown in Da Vinci's "Mona Lisa;" but the "real thing" was not put into this most wonderful portrait in a haphazard manner by an artist who had not studied "composition and all those things from a dry book." Da Vinci spent over four years of actual work on the picture, following many more years of hard study and close attention to dry books.

The man behind the camera who makes six postcard pictures for a quarter spends very little time getting "composition and all those things from a dry book." The only real thing he gets is the quarter in his pocket. Had he more knowledge of "composition and all those things," he would get more of the real thing into his work, and earn more than a precarious living at a summer

resort.

The photographer who would improve his work, who would get the real thing into his portraits, must first know how to put it there. He must study the portraits of every great master, ancient and modern; he must profit by the experience of those who have gone before him; he must read all the books bearing on his art that he can lay his hands upon, even if they are dry. "Knowing how" is only gotten by "learning how."

THE WORK OF MATTIE EDWARDS HEWITT

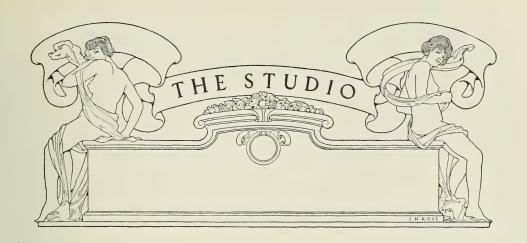
ATTIE EDWARDS HEWITT, whose work illustrates uns her, well deserves the success sition she has won. The and wide recognition she has won. The high order of her work represents an accumulation of much time and closely applied labor, plus instinctive ideas which underlie and control all Mrs. Hewitt's achievements. This success is due, moreover, to something other than skill and patience, for it lies fundamentally in her attitude toward her work. Subjects that present the most difficult problems are the most interesting to her. The essentials for successful photography, Mrs. Hewitt tells us, are the proper treatment of light and the proper point of view.

Mrs. Hewitt is in no sense a newcomer to New York, and is known widely for her work (mostly outside the studio) of architectural photography, interiors,

gardens, country estates, etc.

The reception room in the upper rear of one of the older Fifth Avenue mansions has a delightful cosiness and atmosphere, and presents very favorable comparison with the workroomlike places in which so many photographers struggle to secure artistic and pleasing effect. Perhaps it is that men are not so happy as women in creating attractive, tasteful surroundings!

Mrs. Hewitt does all her own operating and personally supervises every detail of the printing and finishing. She uses 8 x 10 and 11 x 14 cameras, equipped with Bausch & Lomb-Zeiss convertible series VII A for long focus, with Zeiss series V and Goerz series III for wide-angle work. Standard orthonon plates are used, and in the greater part of her finished work she makes sepia bromide enlargements for quality and richness of tone.



PRACTICAL PAPERS ON STUDIO WORK AND METHODS

Dirt

THE time for spring cleaning approaches, and soon we will be taking down the good old stove and be leaving a trail of soot along the carpet on the way out to the ash-barrel. When we take up the zinc we will notice how clean it is underneath in comparison with the surrounding carpet, and we will wiggle the broom a little and spread the dirt around so that the spot will not be so noticeable, and call it a job. At least, a whole lot of us will. Yes, sir, and a few days of wear and blindness on our part will cover the dirt so evenly that it will never be noticed-by us. And the busy little cobwebs that have been collecting soot and smoke during the hard winter months will enjoy the balmy breezes when the windows and doors are opened, and will swing lazily to the wandering zephyrs. Poetic, is it not?

When we go home and find the carpets torn up, the dinner cold, and the place smelling of lye and soap, we will fuss and complain and go to the restaurant or hotel for our meals, and swear softly at the discomforts the madam inflicts upon us by tearing the home to pieces every spring and outdoing herself in making everything uncomfortable. We have to stand it, for she is boss at home, but, thank the stars, she cannot come down to the studio and kill business for a week. She is not boss of the business, although she does run the home, and we are free from her activities there. We can let the darned old dirt stay there just as long as we want to, and we will not kill the trade for a week, but we will kill it permanently if we want to.

permanently if we want to.

This talk of the women folks, from whom and through whom we get four-fifths of our business, that they see dirt as soon as they come into the door, is all bosh. The statement of one lady, who went into a brand-new studio that was finished in white enamel paint and found everything fresh and clean, that it was the first clean photographic studio that she had ever seen that was perfectly clean, was just a fairy tale. Nothing more. We have been dirty for twenty years, and are still doing business. A little anyhow. It is very

bad, but then it is always bad. We do not understand how So-and-So, who must pay a very large rent and goes to a lot of expense to keep his place up so fine, can afford an automobile, for the photograph business has gone to the dogs completely in the past few years. There is so little of it left, now that the amateur has become so frequent, that there is no use cleaning up. It is not the dirt that kills business. Certainly not. The public cannot see the workrooms or the dark-room, and they do not known anything about the trash that has accumulated.

The show case? Well, some day we are going to get at that. It has been so rainy and cold that nobody has been on the streets anyhow, and the case leaks and we cannot help the water stains on the cloth. Guess we will have to make a background of oil cloth, then we will not have to change that old case for two years. It is not practical to put expensive material in it, for the first rain will damage it. It might be made watertight. Yes, we will do that some day when we have time, too. Guess we will have to attend to that, for we cannot use anything but crinkled tissue-paper now, and that shows the water stains very quickly, and after a few months it does look right bad. But nobody looks at our displays anyhow, so what difference does it make?

Some of the demonstrators and travelling men are very cranky. They blame on dirt all of the troubles that show in their products. That is a way that the manufacturers have—they always try to put it on the other fellow. The last demonstrator tried to prove that papers on the dark-room floor kept the chemical dust floating about, and that is what makes all of the spots on the negatives. They ought to be more careful in putting on their emulsions, and not leave pinholes all through them. We have worked in the same dark-room for twenty years, and we have not cleaned up for several weeks, and have not had a bit of trouble until last week, when one lot of plates was just rotten. Lots of times the dark-room has been dirtier than now and everything came out all right. Either the plates are bad or the chemicals are no good. Then the demon-

strators talk too much. They go and tell the manufacturers why we make complaints, and blame it all on the dirt. That dirt has made us no

end of trouble.

That's it. The dirt has made us no end of ouble. If that is the case, then why not get rid trouble. If that is the case, then why not get rid of it? The madam possibly has the right idea, and her week of spring cleaning makes fifty-one other weeks cheerful. It might be possible that the ladies do see the cobwebs, and do not stop to look at the showcase because it is too dirty. It is within the bounds of reason that dirt has got something to do with plate and paper results. At any rate, that dirt has made us no end of trouble, so let's get at it and get it out. Paint is very high just now. It never has been higher. Labor is demanding outrageous wages. But maybe the painter and his high-priced paint might prove a good investment and make more money for us. There is only one way to find out whether that is true or not, and that is to try it. "Spring has came," so let's try something. Try this on you dirt.—Trade News.

Get at the Facts

One of the most important things in planning for your 1918 business is to determine your cost of doing business for 1918. This will give you a basis for determining costs, and you must know costs if you are to be certain of profits. Go at it in this way:

1. Charge interest on the net amount of your total investment at the beginning of your business

year, exclusive of real estate.

2. Charge rental on all real estate or buildings owned by you and used in your business, at a rate equal to that which you would receive if renting

or leasing the property to others.

3. In addition to what you pay for hired help, charge an amount equal to what your services would be worth to others; also treat in like manner the services of any member of your family employed in the business but not on the regular pay roll.

4. Charge depreciation on any goods carried over on which you may have to reduce the price because of change of style, damage, etc. would include frames, mouldings, card mounts, etc., that have been damaged or are out of style.

5. Charge depreciation on tools, fixtures, furniture, or anything else suffering from wear

and tear.

6. Charge all fixed expenses, such as taxes,

insurance, water, light, fuel, etc.
7. Charge all incidental expenses, such as drayage, postage, office supplies, deliveries, telegrams, advertising, etc.

8. Charge losses of every character, including

waste, work made over, bad debts, etc.
9. Charge any other expense you may have had that is not enumerated above.

When you have ascertained what the sum of all these expense items amounts to, you should have your total expense for the year. Divide this by the total of your sales and it will show you the percentage which it has cost you to do business.

Now if you will take this per cent. and deduct it from the price of any article which you have sold, then subtract from the remainder the actual cost to you which in the case of a frame would be cost plus freight, or, if a dozen photographs, the cost of all materials used, the balance will be your net profit or loss on the sale.

When your profits are figured in this way, as they should be, they may be small, but you can be certain that they are profits. If you are not making a profit—if you are only working for yourself for a salary—you can determine what is necessary to make your business pay; whether you should increase prices or reduce expenses,

or both.

If you have the booklet, System for the Photographic Studio, read it carefully, especially that part which explains how to make a statement showing profit of yearly business. It will make you want to know more about your business, and you will not find a more simple system than the one described in this booklet. If you do not have a copy, ask your dealer to send you one at once.—Photo Digest.

The Future

The next five years are going to be the greatest years we ever had, not only from the historical stand-point but in reference to the chance for men who have brains and nerve. A lot of former big fellows are going to shrink and new chaps are going to loom up to the top and over the top. And you can take my word or leave it, that the comers are going to be lonely men when they start out-will be called fools-will find it hard to borrow money at the bank-will be different from the average man, but will have plenty of trailers when the mass gets the idea, at which time it will be too late—for the mass.

What we need most from now on is our heads

and our nerve.

It won't hurt either of them to be overworked. -Warde's Words.

Nots and Buts of Good Business

Not long-face hard-luck stories but Redblood Optimism.

Not surrender to conditions, but Greater Effort to Win.

Not graft, but Service. Not bluff, but The Truth. Not arrogance, but Courtesy

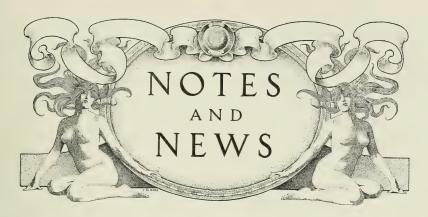
Not cut-prices, but Better Values.

Not war, but Coöperation.

Not get-rich-quick returns, but a Fair Profit. Not our advantage only, but Mutual Satisfaction.

Not some future time, but Right Now.

—Service.



Photographers and Workers Wanted by U. S. Signal Corps for Aërial Photography

ONE thousand men trained in photographic work are needed by the Signal Corps at once, for instruction at the new school for aërial photography just opened at Rochester, N. Y., preparatory to going overseas.

This ground force for America's aërial photog-

raphy requires three types of men:

1. Laboratory and dark-room experts, especially fast news photographers, familiar with developing, printing, enlarging, retouching, finishing, and panchromatic photography, who can take a plate from the airman and hand it over ten minutes later a finished enlargement to the staff officers. These men will work in motor lorries as close to the front and to the staff as possible.

2. Men able to keep the whole delicate equipment in good condition, such as camera and optical construction and repair men, lens experts, cabinet-makers, instrument-makers, etc.

3. Men to fit the finished prints into their proper places in the photographic reproduction of the German front, to work out the information disclosed, and to keep the whole map a living hour-to-hour story of what the Germans are doing. This includes men familiar with map compilation, map-reading, and interpretation, topographical science, and drafting, and requires keen analytical powers.

The primary training at Rochester will cover four weeks, and will be standardized along the highly specialized developments brought out in the war. At its close the successful graduate will be sent on for a month of advanced training, after which they will be organized into units

and sent overseas.

The best men, however, will be given still further training for commission as Photographic Intelligence Officers, first at one of the schools and then in actual flights at the flying fields.

Many men not physically fit for line service are eligible for this so-called limited military service, as defective vision corrected by glasses and other minor physical disabilities are waived. The proportion of officers and non-commissioned officers to privates will be higher here than usual, so that the opportunity for advancement is good.

Men not registered for the draft, and who possess the necessary qualifications, should write to the Air Division, Personnel Department, 136 K Street, N. E., Washington, D. C., for information as to enlistment, accompanying their letter with evidence of their realistations.

with evidence of their qualifications.

Men registered for the draft in the States of New York, Pennsylvania, Ohio, Michigan, Indiana, Illinois, Missouri, Massachusetts, New Jersey, Rhode Island and Maryland, who desire to be voluntarily indicted for this service, should apply to their Local Board and submit evidence of their qualifications. At present these are the only States to which this call applies.

Owing to the shortness of time it is requested that only men fully qualified apply for this service.

Each month there will be one thousand men sent to this school, and they will be given the course in aërial photography. These men may be advanced amateurs, commercial or portrait workers. The opportunity for advancement in this branch of the service is very good. It depends only upon a man's own ability as to whether he wishes to advance or not. After the men have completed their preliminary course at Rochester, they will then be sent to the advanced training schools throughout the United States and given their final instructions.

The Wentworth Photographs

An exhibition of pictorial photography, the work of Mr. Bertrand H. Wentworth, of Gardiner, Maine, was held at the gallery of The Camera Club of New York, from February 12 to March 2, 1918, comprising thirty-eight pictures, 16 x 20 in size. Unlike Mr. Wentworth's display of last year, all of which were framed, the exhibit this year was unframed and appeared under glass only. This enhanced the effect.

While a very few of last season's pictures were included, for the most part new work was hung. Many of these were superior to Mr. Wentworth's former contributions to photographic art; while, possibly, three points were not up to his usually

high standard.

There are few pictorialists who incorporate in their output so many of the higher artistic characteristics. His atmospheres are charming; his expression exceptional; his aërial perspective

(171)

admirable; while his poetic feeling and the marvelous rendering of tender and, sometimes, brilliant light stamp his work as of a high order. His textures and quality, especially in his snow

renderings, are rarely surpassed.

Mr. Wentworth is not a tonalist in the narrow sense. He is not afraid of contrast or of light and form. Some of his finest effects are compassed by light and shade and quite a long scale. Neither does he sacrifice every artistic feature to uniformity, or a high key for an invariably low one. His pictures are the expression of a theme; and everything of art that can contribute to make them pleasing and enjoyable he employs, intelligently and effectively.

The more exhibitions of such work we have the better it will be for the future of artistic

photography.

License for Flash Powders, etc.

FEDERAL Law H. R. 3932 applies to the following items that are in the market: flash powder, flash sheets, flash cartridges, magnesium powder, potassium bichromate, potassium permanganate, nitric acid, lead nitrate, silver nitrate.

All vendors and purchasers of the above items must secure a license authorizing the purchase, possession, and sale (or use) of explosives or ingredients. Licenses will be issued upon application in person through a local licensing officer

at a nominal cost.

A vendor's license authorizes the holder to purchase, possess, and sell explosives or ingredients. A record must be made at the time of each sale, which will include the kind and number of the purchaser's license, his name, quantity, and kind of explosive or ingredient purchased and date of sale. This record must be sworn to and furnished to the Director of Mines whenever requested.

We would suggest that everyone interested procure a copy of Federal Law H. R. 3932, referred to above, either from his local licensing officer, who is usually the county clerk, or from the Department of the Interior, Bureau of Mines,

Washington, D. C.

Photographic Subjects in Leading Periodicals

"New Methods of Producing Tricolor Prints," by W. T. Wilkinson. Photographic Journal, 1917. "The Reduction of Intensified Images," ish Journal of Photography, 1917, p. 616.
"Fading of Autochromes," Inland Printer,

"Reception-Room Specimens," by H. E. Corke. British Journal of Photography, 1917, p. 594.
"Trimming the Print," Kodakery, January,

1918, p. 20.

"The Distribution of Light Intensity in Photographic Images," Motion Picture News, December,

1917, pp. 4240; 4417; 4607; January, 1918, p. 147.

"The Spectral Selectivity of Photographic Deposits," by L. A. Jones and R. B. Wilsey.

Journal of the Franklin Institute, February, 1918, p. 231. "Where Dry Plates Come From," by A. T.

Strong. *Photo-Era*, 1918, p. 63.
"Submarine Cinematography," by L. Calisch *Bioscope*, January 3, 1918, p. 18.

"The British Journal Almanac" for 1918

WE welcome this familiar year-book as an old friend, and, in spite of many war conditions limiting the number of its pages, both text and advertisements, it continues to present the valuable information it has discharged so ably and well these many years. There is much reliable up-to-date information on negative and printing processes and the latest formulæ, with tables and miscellaneous data valuable to every photographic worker. Price, paper, 50 cents; cloth, \$1.00. Geo. Murphy, Inc., agent, 57 East Ninth St., New York, or through this office.

"Photographic Inter-Lens Shutters"

This pamphlet is an illustrated guide, and gives descriptions of photographic inter-lens shutters with directions for cleaning and repairing.

Seventeen types of inter-lens shutters are described and illustrated in the present treatise by means of enlarged plates in order to render the operator more familiar with the construction and arrangement of the mechanism, so that needed minor repairs may be made without loss of time or inconvenience. Price, \$2.50. Published by Wm. O. Hammer, 1085 Fourteenth Street, San Francisco, Cal.

On Trade Finishing

TO THE EDITOR,

SIR: Your editorial on this subject in the March issue proved a most interesting one to me, and I have been at the point of writing you about it on several occasions. It seems to me to be the happiest idea for the advancement of our art that has been proposed for many a day. Since the time when the photographer silvered his own paper, and each and everyone of us had a different theory about silver baths, fuming, etc., we have made giant strides in the direction of separating the art from the trade of photography. Nevertheless the multiplicity of new processes of printing which must be carried on in an up-todate gallery form a source of almost continual worriment to the man who in most cases is supposed to be giving all his thought and care to the production of artistic negatives under the skylight. The experience of a very few weeks, however, will convince one that he must be in a condition of everlasting vigilance concerning his printing-room. We all know how it is. Oh, yes; but the printer tells you he is out of that particular shade of tissue, and the sepia bath is not working well, and the paper has not come for those large groups which must be out tomorrow, and a certain paper works so soft that you must try another brand, as the prints which you have promised for tomorrow have "gone up" in the toning-bath; and just then you are called into the operating-room to make an artistic (?) picture of the special subject you have been hoping to get for the last six months! I say this is all wrong. Why should the artist behind the camera have

¹ This matter of trade printing and finishing is not a new idea and was suggested some years ago. It has been successfully operated in England and it is a question if the time is not opportune for a trial here.—Editor P. J. of A.

the manipulation of a lot of fussy processes continually haunting him? I know of no other trade or profession in which a man is supposed to throw himself into his work to the extent one must to secure artistic things; where he must also have such an ever-watchful care regarding the handling of a lot of delicate work entirely foreign to his own work in hand. To get rid of this bother seems to me to be the greatest advantage of the idea.

We are engaged in a profession of great variance as regards the different seasons of the year. Taking as an instance a man who can barely get out his work during the holiday rush with six assistants, he could in ordinary places run his studio with four the rest of the year, and perhaps barely keep two busy for two or three of the twelve months. What is he to do? Inexperienced assistants, we all know, are worse than useless. Even a new man who has had years of experience is of little value until he has learned your ways and "found himself" in the studio. Yet to carry a large force of experienced people for several months in the year when half as many would do better work is certainly expensive beyond all reason, and tells far too heavily upon the cash accounts of most of us, I fear, to be called good business management.

Then we must all have a place large enough to accommodate the largest day's work of the year, and hence pay rent for unnecessary space in a building which, because it must be centrally located, clean, accessible, and with a good entrance, costs a good bit for rent, while half the space would serve better much of the time. This, of course, could be avoided in the "trade printing-house," which would be better located out of the way of the dust and smoke of the city than in it. A man could go out from the printing-house every morning and make the rounds of the galleries, to collect negatives which the photographer could have ready, with full directions, each in its envelope properly marked.

In the trade printing-house an expert in each kind of work could devote his entire attention to the production of the very best that particular process was capable of. Under his immediate direction inexpensive help could do much of the rough work that now must be done by the same hand which must be sufficiently expert to print and develop a carbon properly. This would allow the carrying of a large force by the printing-house in busy seasons, while in dull months this force could be materially cut down with the knowledge that the work would not suffer in consequence, as the expert would still remain.

as the expert would still remain.

The photographer with his reception-, operating-, and dark-rooms only would have so much better chance of developing into an artist than he who must give half or more of his attention to mechanical and chemical work. Separate the art of photography from the trade of photography, and each will be the better for it. The photographer with his mind clear of all fussy hindrances of the printing and finishing department is indeed ready for his sitters. The idea impresses me most favorably, and the "trade printing-house" will have no more enthusiastic supporter than

Yours truly,
March 4, 1918.

JAMES WALLACE.



GILBERT E. MOSHER
PRESIDENT OF THE HALOID COMPANY

Aërial Photography for the War

PLANS have been completed for the great enlargement of facilities for training and equiping the aërial photographic force for photographing the German trenches from the skies and keeping up to the last minute the large composite picture of the whole German front. Future facilities will be three times those at present existing and will be in full operation in three weeks.

The three schools now operating at Langley Field, Fort Sill and Cornell will be consolidated into one large school of Aërial Photography at Rochester, N. Y., where all the primary training will be done. Special equipment has been provided, with over 100 instructors. The present schools will be used for special and advanced training, particularly for the Photographic Intelligence Officers who will accompany the planes into the air on special occasions.

The bulk of the training, however, will be for the developing and printing work which must be done on a standardized plan under processes specially developed during the war, and often in great haste on special motor lorries close to the front and to the staff. After a month's course the men will be given a short advanced training and immediately sent overseas for operation in the American sector.

Aërial photography has greatly developed during the war. During the single month of September, British official reports state that 15,837 aërial photographs were taken by the British alone. No new trench can be dug, no new communication system opened up, no new batteries placed but the ever-present and infallible camera above records it for the examination of the staff below. So piercing has been this work that camouflage has been developed as a protection, thus forcing aërial photography to even greater

ingenuity.

Every sector of the front is divided into plots about half a mile square, each one numbered and entrusted to a squad of photographers who become fully familiar with it. As fast as the photographs are made, they are developed, printed, reduced or enlarged to a standard scale, and then fitted into their proper place on the large composite photograph of the sector. This work requires a large force of experts in developing, printing and enlarging, as well as in map reading and interpretation.

Cases are on record where only twenty minutes have elapsed from the time a photographer snapped his camera over the German trenches until the batteries were playing upon the spot shown. In that time the airman had returned to his lines, the photograph been developed and printed, the discovery made, and the batteries

given the range and ordered to fire.

A Suggestion to Think About

Would it not be well to discontinue conventions during the war in order to save railroad transportation, time, money and the waste of food at banquets?

Chemical Specialties

Messrs. Chas. Cooper & Co., 194 Worth Street, New York, have just issued a new pricelist of their chemical specialties, which they will be glad to send to any address on application.

Cost and Product

We are living and carrying on business under conditions which four years ago would have been considered impossible, yet on the whole photographers have not done badly, in spite of the enormous increase in the cost of all materials and the much higher rate of wages which has prevailed in consequence of the scarcity of skilled labor. To attempt to prophesy when the present state of things will end and what conditions will prevail after the war would be a fruitless task, but one thing is certain—that money will not be so plentiful and that prices will not in our time sink to the pre-war level, especially in the case of wages, which are, outside "one-man" businesses, one of the greatest outgoings in most concerns. It is therefore necessary for every producer so to organize his establishment that he is assured that he is receiving full value for every penny of his expenditure, and this applies to the smallest as well as the largest businesses.

Photographers as a class are not good men of business, not because of any lack of mental capacity, but simply from lack of training. In only a few instances can we recall the names of those who have made large fortunes, and they were business men who never did any practical work themselves, devoting their energies to directing and exploiting the labor of others. This is no reason why the photographer should not endeavor to acquire the special knowledge and habits which make the difference between struggling for a bare existence and piling up a comfortable

surplus.

In every successful manufacturing concern the manager has the words "cost of production" burnt into his brain, and next to maintenance, or, better still, improvement of quality, they are his chiefest care. Hard work does not always tend to economy. Some men are so busy that they cannot stop to look and find the openings through which the results of their industry are leaking away, while others, with more business acumen always seem to have time for any necessary purpose without neglecting the ordinary run of work. How can we apply this to the photographer? The first point to be considered is that of labor, and unfortunately the great body of photographers have not yet realized that in buying this, as is the case with most commodities, the best is the cheapest in the long run. A skilful, well-trained assistant, who can be relied upon to develop batches of plates uniformly and well and turn out his tale of perfect prints without constant watching, may command three to five dollars a week more than a duffer; but the saving of material, not to speak of the release of the principal for more important work, will soon show a balance on the right side. It may be urged that such assistants are difficult to find, but if they cannot be found they must be made. general entry of women into all branches of the profession has made a great difference in this respect. Leaving out operating, a field in which women certainly have made good, we have darkroom hands, platinum and bromide printers who were formerly spotters, who have taken up the new work with enthusiasm since 1914, and can now give points to their male predecessors both as regards quality and quantity. One error must be avoided, and that is of endeavoring to get efficient female labor at a lower rate than should be paid to men. We are convinced that such a policy is a mistaken one. In many studios, even now, girls are employed at wages on which they could not exist if they were not living with their friends, who are thus indirectly subsidizing their employer's business. How can it be expected permanently to attach their interest to the business?

Closely connected with the efficient and well-paid assistant is the question of economy of plates and other materials. The worker who realizes that his future prospects and general well-being are bound up with those of his employer is not likely to waste material himself or to allow others to do so. By careful attention to storage and wrapping alone, many dollars a year could be saved in the matter of mounts, plates and paper in studios of even moderate size, and this could be added to by equal care in the mixing and use of chemicals. Where bromide paper is used from the roll it is often cut to waste, and very often there is much paper wasted upon trial prints for which a fragment would have sufficed. All these economies may seem trifling and almost unworthy

of notice, but in a case recently under notice they resulted in a saving of \$250 in the year, and there are few photographers who would refuse that sum

even at the cost of a little vigilance.

Cash discounts afford one of the easiest ways of making or losing money, whichever way one likes to put it. If 5 per cent. is lost by not paying promptly each month, it comes to 60 per cent. per annum on the amount of one month's purchases. Surely it is worth while to save this by dispensing with all unnecessary expenditure until everything is paid up to date and full discounts taken. Slackness in bookkeeping is another way of dissipating profits. If statements are not regularly and promptly rendered, removals, deaths and other happenings may render recovery of debts difficult if not impossible. Steady, polite dunning will be found the best policy. More than one business has learned to its cost that a long period of slackness followed by drastic measures in the courts is not the way to retain popularity either with bad payers or their friends, who might be desirable customers in the future.—British Journal of Photography.

The Gross Photo Supply Co. Fire

THE Gross Photo Supply Co., of Toledo, Ohio, had a disastrous fire on Thursday, February 7. Practically the entire stock of photo supplies went up in smoke, but fortunately the machinery and a considerable part of their raw material was saved and the firm lost no time getting into shape again, so that in very short order their customers were taken care of even better than before. We admire the fine spirit and energy of this enterprising and progressive firm which fire and water cannot squelch.

Report of the Professional Photographers' Society of New York State Convention

THE Fourteenth Annual Convention of The Professional Photographers' Society of New York was held at Hotel Utica, Utica, N. Y., on February 26, 27 and 28. The attendance and general interest was better than expected, and for these war times was most gratifying. The pictures exhibited (215) were unusual and much admired. Interesting and profitable talks were given by Pirie MacDonald, Frank Scott Clark, Howard D. Beach, J. E. Mock, Ryland W. Phillips, S. H. Lifshey, E. L. Mix and others, while "Pop" Core did very much as usual in contributing toward the practical features and keeping things alive.

The following questions were proposed to be answered by those present. Question No. 1 was the only one that received consideration:

1. What developer are you using in place of metol?

2. How do you dope your negative for retouch-

ing? 3. How do photographers in small towns handle appointments?

4. Questions on commercial photography.
5. What is your practice regarding payment

at time of sitting?

6. How can prints be dried flat and quickly? The Committee appointed for selecting the next place of meeting reported favorably on Elmira, N. Y., and that place was selected for

The Nomination Committee recommended the following, and they were elected unanimously: President, Fred T. Loomis, Elmira; Vice-President, A. D. Rice, Jamestown; Secretary, Frank E. Hewitt, Corning; Treasurer, Edwin Park,



FRED T. LOOMIS PRESIDENT PROFESSIONAL PHOTOGRAPHERS' SOCIETY OF NEW YORK

The Treasurer reported 110 members, all bills paid, and a good balance in the treasury

The Committee on Resolutions reported on all those who had rendered services to the Society by demonstrations and lectures, the Buffalo Camera Club for their loan exhibit, the Utica photographers for their hospitality, the Hotel Utica for its favors in giving the meeting-place, the photographic and local press for the liberal space they

A special resolution was adopted and a copy ordered to be sent to the President of the United

States, as follows:

"WHEREAS, The United States is now in a state of war on the side of the brave Allies against

a common foe; and "WHEREAS, It is the duty of every citizen and resident of the United States to do, not only his share, but his very utmost in carrying out, to the last letter, every demand made upon him by the Government of the United States; therefore be it

"Resolved, That we, the members of the Professional Photographers' Society of New York, photographers all, men and women, do hereby pledge ourselves collectively and individually to help and serve those placed in authority over us with all our physical and financial ability, and this not because we meet as citizens, but because we want to as true Americans.

The general opinion of all was a stirring convention with much good fellowship and fine fraternal feeling—May there be many more such!

"The Perfection" Developing Tank System

This new "Perfection System" consists of four tanks—developing, rinsing, fixing and washing—so simple, and so complete that it permits of the turning out of the maximum number of films per hour with a minimum amount of developer.

The tanks are light in weight and are strong

and durable.

A set of four tanks will take up a floor space

of 16 inches wide by 65 inches long.

A set of three tanks will take up a floor space

of 16 inches wide by 49 inches long.

A set of either three or four tanks may be grouped in a cluster when a narrow space is not obtainable.

Each tank may be connected to the general drain pipe leading from the washing tank, thereby rendering the emptying of developer, washing, and fixing tanks a very simple operation.

The developing and fixing tanks are made of heavy gauge steel, welded together and seamless, heavily enamelled to withstand the chemicals used in development.

The washing and rinsing tanks are of heavy sheet metal, having an acid- and water-proof

coating.

washing tank supplied with this "System" is one which eliminates the hypo in the shortest possible time. The water enters the bottom of the tank in two places, gushes upward and overflows through a drain pipe in the center of the tank.

It can readily be seen that this constant upheaval of water thoroughly eliminates the Hypo from the films and from the tank, washing the films very thoroughly in the shortest possible

The "Perfection System" is for sale by the Northern Photo Supply Co., Minneapolis, Minn., who will gladly furnish further particulars.

A Few Reasons Why Customers Do Not Return to the Same Studio

Attempts to substitute a style or size of picture or mounting when the customer knows just what he came for. Errors and delays.

Tricky methods. Slow deliveries.

Over-insistence of the sales people in the reception-room and insolence of the same.

Unnecessary delays.

Tactless business policies.

Bad arrangement and untidy reception-rooms. Ignorance of the people in the studio regarding prices, sites, quality, etc.

Refusal to exchange mountings or make resittings without extra charge.

Poor quality of photographs delivered.—Ohio Photo News.

New Price List in Effect on Bausch & Lomb Tessar and Protar Lenses

Effective January 15, a new price list was put out by the Bausch & Lomb Optical Co., on B. and L. Tessar and Protar lenses. Furthermore, only those lenses listed in the new price list can be supplied to the trade. You should write for a copy of the new list or get one from your dealer.

A little booklet, entitled Useful Tables for the Photographer, can be obtained at the same time for the asking. This contains reducing and enlarging tables, view angles, shutter speeds for moving objects, etc., and many other items of value. For those who are studying photography for the army and air service in the camps this little booklet is of special value.

Landscape Foregrounds

In a landscape composition the foreground is always the most important part of the picture. It matters little how strong an interest one may get in the distance or in the middle distance, the eyes turn inevitably to the foreground, and any weakness there exercises its influence over the whole picture. We see that in connection with focussing. The slightest want of sharpness in foreground objects is perceptible at once; but the distance will stand a great deal of softening before it is noticeable or, at least, aggressive. The old hand at landscape work therefore can be recognized, if by nothing else, by the attention he gives to the choice of a foreground. It is fortunate that in this matter we are favored by circumstances. To change the distant parts of the picture appreciably we must move our stand-point a considerable distance; but a foot or two will often do all that we require in the way of modifying the foreground. Particularly is this influenced by the height of the camera; lowering this sufficiently will cause quite trifling objects close at hand to come prominently into the picture. If the worst comes to the worst, we may even build up a landscape foreground by moving branches of trees, bracken, etc., or by cutting away undergrowth that is not required; but it is best to avoid this, if it is in any way possible, as there is apt to be a trace of unreality about such foregrounds however careful one may be. Instead of actual objects one can often do all that is wanted in the way of a foreground by using sunlight and shadows; and few more interesting or beautiful arrangements of tone can be thought of in a landscape than shadows will provide.—Photography.



The WORKROOM

ONTAINING THE LATEST PROCESSES, FORMULAE AND APPLIANCES NEEDFUL IN THE ART OF PHOTOGRAPHY FOR THE OPERATOR & WORKER

PRINTING-OUT TRANSPARENCY PLATES BY THE GELATIN PROCESS

SOME METHODS OF TONING LANTERN SLIDES

RETOUCHING LANDSCAPE NEGATIVES

MISCELLANEOUS HINTS ON RETOUCHING FOR BEGINNERS

COVERING POWER OF LENSES AND STRAY LIGHT IN THE CAMERA

QUALITATIVE TESTS FOR THE MORE COMMON DEVELOPERS

SMALL ECONOMIES

THE HYPO SCARCITY: WHAT TO DO ABOUT IT

SOME PECULIARITIES OF COLOR AND THEIR BEARING ON PHOTO-GRAPHIC WORK

THE USE OF OLD PLATES

CENTERING FILMS IN THE ENLARGER CARRIER

FOR BROMIDE PRINTERS

PHOTOGRAPHING ANIMALS



THE WORKROOM

By the Head Operator



Printing-out Transparency Plates by the Gelatin Process

It will be found very convenient to have ready to hand plates that can be relied upon for making transparencies for the lantern; plates that can be depended upon to yield transparencies that are clear and brilliant, and at the same time to ensure with certainty that twelve good pictures will be the result from a dozen plates.

The usual method of making transparencies

upon gelatin plates by development can be carried out in a reliable manner by those who are engaged in transparency making, but there are a large number of persons who only make transparencies occasionally, and thus only too often is it the case that only a few good plates result. The general cause is want of clearness in the shadows and insufficient density, both these defects being caused by a thin veil of fog all over the plate, from using an excess of alkali or from the plates having been kept a long time

before use.

Now it is possible, and thoroughly practicable, to prepare plates for one's own use that are reliable, will keep well, and never fog or veil, not even when they have been slightly exposed to the action of light; in fact, the plates about to be described can be manipulated in any ordinary room, as they are not developed, but printed direct upon the glass, with no operation of transfer. They can be handled in just the same way as printing-put papers, will keep well any length of time before use, and also can be kept for months between the time of printing and the after-operation of finishing by toning and fixing. Any color may be obtained, from a sepia to a rich brown or purple brown; in fact, they produce results as nearly like the albumen transparency as possible.

It has been known for many years that the most brilliant of all transparencies obtainable, with shadows so clear that there is next to nothing but clear glass, have been those made with wet collodion, which, after being fixed and well washed, were toned with a chloride of palladium solution, consisting of six to eight drops of a 10 per cent. solution of chloride of palladium to 20 ounces of water with a few drops of sulphuric acid added. In the present case, as there is no developing required, the color wished for is obtained entirely in the toning. There will not be many materials or utensils necessary, and those that will be required are both simple and inexpensive. Two small stoneware crocks will be required, each of about half a gallon capacity. They should be well cleansed with hot water. Do not use any soap or other alkaline cleaning substance. After well washing in hot water,

rinse them out with clean cold water; do not wipe them, but turn them upside down, upon clean blotting paper to drain. To prepare the sensitive emulsion proceed as follows, and bear in mind that in the formula for making the emulsion distilled water must be used. The afterwashing of the emulsion may be carried out in ordinary clean cold water.

Into one of the crocks place the following:

Cut the gelatin up into strips and allow this to soak for half an hour. Now prepare the fol-lowing in clean wide-mouth bottles, as these are more easily handled than bottles with narrow mouths:

uths:		
	No. 1 nonium, C. P 45 g	
Rochelle salt .	No. 2 100 g 1½ c	
Nitrate of silver Citric acid (pow	No. 3 1 oz. 80 g dered) 95 g 10 c	gr.
	No. 4 alum 90 g hot 5 c	

As soon as the gelatin has become well soaked, place the crock containing it into a large saucepan; pour into this some cold water, so that it stands up about three inches around the outside of the crock; now place the whole upon a gas stove until the water is brought to boiling-point; meantime add the solution of chloride of ammonium. Stir this well with a glass rod, then add the solution of Rochelle salt. Next add the acid solution of nitrate of silver; add this very slowly, stirring well all the time; rinse each bottle out with a little distilled water. Pour these into the crock containing the emulsion. The crock may now be removed from the saucepan, placed upon a piece of clean board, and the hot alum solution added. During this addition the emulsion must be stirred well, and the solution added slowly. Of course, the mixing of these chemicals must be done under a nonactinic light, a small gas jet or the light of a kerosene lamp a few feet distant from where the mixing occurs will be safe. After the alum has been added, five drops of strong ammonia may be added, and stirred well. Add last of all one and a half ounce of pure alcohol (photographic).

Add this very carefully, stirring well, because if it is added too suddenly the gelatin will become partly coagulated and give some trouble

when the emulsion is remelted.

The emulsion being now made up, it will present a very creamy appearance. It must now be stood aside in a cool place to set, which it will be found best to do by preparing the emulsion overnight, and allowing it to become set by the next day. When the emulsion has become completely set, it will present the appearance of a stiff block of blanc mange.

The next operation will be the washing of this emulsion. There are several ways of accomplishing this. One is to cut the emulsion up into small pieces, and allow them to soak in clean cold water for an hour; then to change the water several times. The cutting up is done with a bone knife or a hard-rubber paper-cutter (do not use a metal knife of any kind), but the best way to break up the emulsion, the one the writer has invariably used, is to procure a piece of canvas, with a very coarse mesh from a store where ladies' worsted work can be purchased. A square yard of such canvas can be purchased for thirty or forty cents. Take a piece of this about eighteen inches square, place a few lumps of emulsion in the center, bringing the corners together; then, when the canvas is tight around the emulsion, hold the mass tightly by the left hand and give the folded ends a strong slow twist with the right hand, taking care to squeeze that part well that is in the left hand at the same time. The result will be that the emulsion breaks up completely and squeezes through the meshes of the canvas in such size pieces as become easily permeated by the cold water into which it is allowed to fall. The whole batch of emulsion must be treated thus. As soon as this is done, tie the piece of canvas through which the wringing has been done over the top of the crock. Upon tilting the crock, the water becomes drained off, and the shreds of emulsion remain behind by virtue of their swelling up to a size larger than the meshes, and so remain in the crock. Another supply of fresh cold water must be added. The object of this washing is to free the emulsion of the salts produced by chemical decomposition, which would be harmful to the result, as these salts would crystallize out upon the glass plate, and become deliquescent, and thus produce a sticky, useless coating. emulsion will require four changes of wash water, allowing fifteen minutes to soak after each washing. Now tie the piece of canvas over the top of the crock once more, invert it, and allow the whole to drain for an hour; this being done, the emulsion will now be ready for remelting and filtering for plate coating. One more solution must now be made up as follows:

Nitrate of silver 120 gr. Distilled water 2 oz.

As soon as this is prepared the emulsion is

ready for use.

It will be necessary in the first place to have all the glass plates ready for coating. These must be very clean and quite free from finger-marks or greasy spots; in fact, chemically clean, which can be easily accomplished by proceeding as

follows: Take five or six dozen plates of the usual lantern size, and place them, one by one, into warm water, to which a small quantity of common washing soda has been added, or a few ounces of ordinary carbonate of soda (not bicarbonate). This alkaline solution must be rubbed well over both sides of each plate. The plate may be rinsed by dipping it into a vessel of clean water, then placed into a tray containing hydrochloric acid one part to twenty parts of water. As soon as the plates have all been treated in this way, remove them one at a time, and allow a stream of water from a faucet to run over the plate. Then place them in a clean rack to dry, away from dust. As soon as they are dry, pack them together, on end, covering them with a

clean sheet of paper, ready for coating.

Coating the Plates. A sufficient quantity of the washed emulsion must now be taken and melted in the second stoneware crock by placing it into hot water, just the same as in the first instance when making the emulsion up. As soon as the emulsion has become liquefied, and the temperature about 120° to 130° F., add to each ten ounces, three fluidrams of the nitrate of silver solution. Stir this well, then add half an ounce of pure alcohol. When this is well incorporated, the emulsion must be filtered while still hot, which is accomplished by using a kerosene lamp chimney with a piece of cheesecloth tied over the top. The chimney then must be inverted and a tuft of absorbent cotton pressed into it upon the cheesecloth sufficiently tight to prevent it rising when the emulsion is poured into it. Place this chimney into a hole made in a piece of board, or, if a retort stand is at hand, use that. Place a clean stoneware pitcher beneath, having been previously made hot by being filled with hot water and then emptied. This is to keep the temperature of the emulsion up. Now pour the emulsion into the inverted chimney. It will filter perfectly in this way, giving a very clean and beautiful emulsion, with no grain, As soon as the filtering is complete, take a sixounce glass graduate, and having made it warm, pour into it about four ounces of emulsion. Pour the emulsion so that no air bubbles are formed because these are not easily dispersed in a thick viscous body like this. If any bubbles should be formed they must be removed quickly by the use of a glass rod or by dropping upon the surface a few drops of alcohol, when they will disappear instantly. The alcohol becoming mixed with the emulsion will do no harm. All being ready, take one of the glass plates, hold it by the top left-hand corner, pour upon the middle a small pool of hot emulsion, tilt the plate, first to one corner, then to another, until it is evenly coated. Drain the excess of emulsion into the graduate, by allowing the glass plate to touch the inside near the top, then no air bubbles will be formed. Allow a moderate quantity of emulsion to remain upon the plate, then lay it down upon a slab of slate, glass, or marble that has previously been levelled, to allow the emulsion to set. Coat all the glass plates in just the same way, and as soon as the emulsion upon them has become set, place them in a very clean rack and stand aside in a clean room, or large cupboard away from all dust and dirt to dry As soon as dry, they may be

packed back to back with a small strip of thick paper at the ends, so as to keep the faces from touching or becoming abraded. This precaution is very necessary, as any defect upon the plate would be magnified many times upon the screen and thus spoil what would otherwise prove to be

a perfect picture.

Printing the Transparency. The plates being now ready for use, select the negatives from which the transparencies are to be made. Supposing the negative is a 5 x 7 or a 4 x 5. In either case place the negative in an ordinary printing frame, and upon that part of the negative, from which it is desired to secure a print, place the transparency plate. Place upon this a piece of black paper, then the usual pad, assuming that the negative is quite clean. Place the printing frame in the sunlight, or bright daylight, allow the printing to continue, until, when opening one-half of the frame, and viewing the progress of the printing by transmitted light, or in other words, by looking through both the negative and plate, the shadows present a bronzed and deep red appearance. When this point is reached, remove the plate and place aside for toning.

Tone in the Following Manner: Either of the two toning baths here given may be used with success, and good colors produced with either. The bicarbonate of soda bath is somewhat quicker in action than the one made with borax, although the borax bath gives a very wide range of tone.

The Toning Solutions

No 1
Saturated solution of borax . 2 oz.
Solution chloride of gold (1
grain to oz.) 2 oz.
Water 20 oz.
When mixed it is ready for immediate use.

		No.	2		
Water .					20 oz.
Bicarbonate	of so	oda			60 gr.
Chloride of					
grain to o					
Acetate of s	oda				30 gr.

This should be mixed in a bottle, and well shaken, and can be used at once. Having the toning bath ready, take half a dozen of the plates, lay them face up in a suitable tray (which must not have been used for any developing purpose), trays made of hard rubber or some composition answer well for this purpose, because the bottoms of these trays are uniformly flat; pour over the plates a gentle stream of water, preferably from a pitcher or jug, until the plates are well covered. Do not employ a heavy stream of water. This will drive the plates out of position and they will become mixed up in the tray. Rock the tray slightly, so that the surfaces of the plates become exposed to repeated changes of water. In the course of a few minutes, pour the water off carefully, and wash again with clean water. This operation must be repeated four times, the object being to eliminate nearly the whole of the free silver contained in the gelatin film. As soon as the washing is complete, pour off the water and pour on the toning solution. Rock the tray gently, and watch the result by removing occasionally one of the plates, examining it by reflected light from a piece of white paper or cardboard. Do not try to judge the color by looking through them. Always examine by reflected light. Do not carry the toning too far. A slight change in color is all that is necessary, because they will dry down to a color fully three times as deep as that presented while wet.

As soon as the toning is complete, place the plates into a tray of clean water, to wash off the excess of toning solution, then proceed to fix the image by placing the plates in the following:

Water 20 oz. Hyposulphite of soda . . . 2 oz.

Allow the plates to remain in this bath for ten minutes, rocking the tray occasionally. As soon as this operation is completed, pour off the solution, and wash the plates well for five minutes, then place them in an alum bath composed of white powdered alum one ounce, water ten ounces. Be sure this solution is clear and clean. If there should be any undissolved alum floating in the liquid this will mark every plate, and cause innumerable spots. Five or ten minutes soaking in the alum will be sufficient. The plates must then be washed in running water for half an hour, then the surfaces carefully wiped with a light tuft of absorbent cotton, in a stream of water, then placed in a rack to dry. It will be observed during drying that a considerable change in color takes place. Those that are toned to purple brown show up upon the screen most brilliantly.

If any of the emulsion is left over, it may be kept in the crock in which it was melted, and kept for future use, and that portion of emulsion that has not been melted, but still remains in shreds already washed, may be kept in good condition for about six weeks by pouring an ounce or two of pure alcohol over it and covering with the stoneware lid that is usually supplied with this

class of stoneware.

In all the operations, from the making of the emulsion to the finishing of the printed plate, there will be no need to fear a fogged plate. All that will be necessary will be to perform the various manipulations under a light not stronger than that emitted by an ordinary kerosene lamp. The emulsion being extremely fine, possesses practically no grain. Anyone will find, in following these directions, that they will be rewarded with complete success.

Some Methods of Toning Lantern Slides

THE following toning methods are all applicable to slides that have been fully developed and fixed. Methods 1 to 8 are specially suited to dense images, and methods 9 to 12 to weak ones, hence it is often possible to produce a good result from a slide that would otherwise be useless by reason of erroneous exposure or development. When several exposures are made from one negative in the endeavor to produce by development alone the best possible result, most, if not all, of the rejected slides should be capable of conversion into good toned slides. The exact

tone obtained varies with the brand of the plate, the tones described being those produced on Thomas's plates.

FOR DENSE IMAGES

Chloride Toning (Reds and Red Browns). No. 1. Suitable for a slide of full but not excessive density

Bleach the image thoroughly in:

Potassium bichromate 10 gr. or 20 gm. Sodium chloride (table

salt) 5 gr. or 10 gm.

Hydrochloric acid

(about) . . . 5 min. or 10 c.c. Water 1 oz. or 1000 c.c.

Add the acid tentatively, only using enough to make the solution act readily. After bleaching rinse, soak in 5 per cent. potassium metabisulphite until yellow stain is removed, and then wash well, dry, and expose to sunlight until the image is a red color. The red is obtained more easily if the slide is exposed as soon as dry; if kept away from sunlight for some time the image loses sensitiveness and it will then only assume a brown tone when sunned.

The result must be kept dry and the tone is then practically permanent, the only effect of time being a slight softening of the tone. The sunning process makes the image insensitive to the feeble light of the lantern and no further

change due to light need be feared.

The result may be both intensified and made browner by treatment with copper bromide or mercury bromide followed by washing and exposure to light. (See methods 4 and 10.)

A peculiarity of this chloride process, and of the following processes up to No. 7, is the great trans-

parency given to the shadows.

No. 2. Suitable only for a very dense slide,

with slight fog.

Bleach in a 5 per cent solution of ferric chloride. Wash, first in water acidulated with sulphuric acid to remove yellow stain, and then in plain water. Dry and expose until a bright red tone is obtained. The exact tone will vary with the quality of the slide, which must be very dense to give a good red. *Iodide Toning (Browns)*. No. 3. Most suitable with very dense slides.

Bleach in chloride solution and wash very thoroughly as in No. 1 method, then soak in 5 per cent. potassium iodide until image is yellow throughout. Wash again and dry. Exposure has hardly any visible effect and may be omitted. In the lantern the tone is a soft brown, and the result is very permanent.

No. 4. Suitable for an over, but not exces-

sively dense slide. Bleach in:

. 24 gr. or 50 gm. Copper sulphate Potassium bromide 24 gr. or 50 gm. 1 oz. or 1000 c.c.

Wash well and then soak in 5 per cent. potassium iodide for five minutes, wash again, dry and expose. The result is a very pleasing soft brown (umber) and very permanent. The color is similar to that obtained by the mercury methods to be described (Nos. 9 and 10), but these

methods are only applicable with weak slides, while this one requires a dense slide.

Bromide Toning (Gray and Brown). Suitable for slightly over-dense slides.

Bleach in chloride solution and wash as in No. 1 method, then soak in 10 per cent. potassium bromide, wash again, dry, and expose until the image is gray.

This may be regarded as a method of reducing an over-dense slide by the process of turning the black deposit into a transparent gray one. gray is a good one with just a trace of warmth.

No. 6. Suitable for a slide slightly less dense than the preceding one.

Bleach in copper bromide solution as in No. 1 method, wash, dry, and expose until image is gray. The result is similar to that of No. 5 method but the tone is darker.

No. 7. Suitable only for very dense slides. Bleach is 5 per cent. ferric chloride solution, clear and wash as in No. 2 method. Follow with a soaking in 10 per cent. potassium bromide for five minutes, wash, dry, and expose until the image is a gray brown, or a near approach to a

true sepia.

Copper Toning (Red). No. 8. Suitable only for a very dense slide.

Bleach in 5 per cent. potassium ferricyanide, wash very thoroughly, and preferably, dry the film. Then soak in copper bromide solution (or in copper chloride) until a red tone is obtained. Wash again and dry. The result is very similar to the red given by the uranium method (No. 12) but somewhat softer. It is different from that of Ferguson's copper toning bath and requires a much denser image.

FOR WEAK IMAGES

Mercury Toning (Browns). No. 9. Suitable for slides of slightly under normal density.

Bleach in 5 per cent. mercury chloride solution to which a few drops of hydrochloric acid have been added. When washed, dried and exposed, the result is a very good soft brown. -Exposure has so little visible effect that it may be omitted.

If this bleached image is treated with ammonia, soda sulphite, or hypo, a deep purple brown is obtained, and the result seems to be much more permanent than in the case of negatives that have been intensified by similar methods.

No 10. Suitable for slides well under normal

Bleach in 5 per cent. mercury chloride solution in which 5 per cent. of potassium bromide has been dissolved. Wash, dry and expose. The result is a slightly deeper brown than that given by mercury chloride. Exposure is necessary to bring out the difference between the two tones.

This image becomes a transparent purple brown if treated with hypo, but it is not much affected by ammonia or soda sulphite and the small effect that is produced is not permanent. If in either of these two mercury methods the shadows become too dense and clogged, then hypo is the best remedy.

No. 11. Suitable only for a very weak image

quite free from fog.

To one ounce of 5 per cent. mercury chloride solution add slowly and with continual stirring a 10 per cent. solution of potassium iodide until the orange precipitate first formed is just dissolved and the solution is quite clear, then dilute with water to make two ounces. Soak the plate in this solution until the image is brown, then wash in changes of still water until the brown changes to a bright orange. Rinse gently and dry. Running water if used will produce stains that are difficult to remove. The result, seen in the lantern, is a very glowing warm brown of great luminosity.

Uranium Toning (Red). No. 12. Suitable for slides of (or just under) normal density.

Tone the image very thoroughly in:

Uranium nitrate 1 gr. or 2 gm. Potassium ferricyanide 1 gr. or 2 gm. Acetic acid . . . 1 dr. or 120 c.c. Water . . . 1 oz. or 1000 c.c.

Tone until the image is as red as it will become on both sides, then soak in a 1 per cent. solution of ammonium sulphocyanide until all yellow stain disappears. Add 2 grains of potassium ferricyanide to every ounce of the sulphocyanide solution and again soak slide until the image is a bright red. Wash gently and dry. This red tone is fairly permanent and is not liable to any deterioration that will materially affect the tone of the projected image.

Retouching Landscape Negatives

Whether the reader intends to devote serious attention to portraiture or not he will find the discipline of learning to retouch a few portrait negatives of wholesome service in dealing with landscape and figure work, because in a portrait a dot or line more or less may make an appreciable difference in the eye or mouth, etc., but in dealing with rocks, trees, etc., a somewhat greater license may be permitted. Thus the portraitist passing to landscape work enjoys his freedom, but journeying the other way he would be continually feeling the curb.

As regards the use of the pencil, stump and

knife, the procedure in both classes of work is similar, but in landscape the brush (charged with color but kept nearly dry) is of much more general application for both sides of the negative. In landscape one may offer a bit of general advice, viz., use the softest pencil or largest brush that will do the work. This tends to give the work breadth and unity of style, and helps one to guard

against spottiness.

He must be ever learning characteristic forms of trees and know at a glance the essential difference between the forms of leaves, the angles at which branches join each other, and the main stem, the difference between the young and old tree, the character of the bark, and so on. The forms of rocks and the way different kinds crumble away under the influence of weather, the characteristic colors, and outlines of the limestone or sandstone must be familiar. He should also have a general knowledge of the characteristic attitudes and movements of domestic animalsdog, cat, horse, etc. The sharpening of an ear, or eye blurred by movement, may convert what might be taken for a "stuffed dummy" into a life-like object. Cloud forms will engage his extra-careful study and equally careful and

delicate handling, and the retoucher is advised to let knowledge always, and here especially, precede practice. The defects of photographic procedure may be regrettable, but the atrocities produced as "home-made" clouds by ignorant hands are simply excruciating. Water in various forms will also require close attention, noting the difference between the reflections in calm and moving water, the difference between clear and muddy water, shallow and deep water, the difference produced by bright or cloudy weather, the form and tone value of reflections (often wrongly called shadows) receiving special study. Shadows cast by opaque objects, buildings, trees, must also be closely studied. We must not only notice their shapes but also their intensities, observing that the shapes alter as the sun is higher or lower, and the edge is sharp or soft as the sun is unclouded or clouded. Shadows exist when no sun is visible, *i. e.*, on a gray, cloudy day. In this case they seem to begin and end nowhere, yet are here, there and everywhere, and demand very careful retouching. The effect of distance, fog, mist and time of day and year on shadows must all come within the retoucher's course of study or he will assuredly do more harm than good by his work. Wind and rain will often blur or partly blot out fine twigs against the sky. In some cases we may advantageously remove these twigs by levelling up to the sky density; at others we must sharpen up and retain them; at other times a slight blur will help on the suggestion of movement. Snow pictures require very careful handling by the retoucher, who may easily do more harm than good. It is of supreme importance to preserve the characteristic transparency of the shadows in freshly fallen snow in the foreground. Our attention will here generally be confined either to very slightly reinforcing the highest lights where the exposure has been full, or reducing them when it has been too short. The same general treatment applies in the case of white draperies.

One of the commonest defects in landscape work is spottiness and patchiness, due to lack of breadth. This is especially the case with sunlit foliage, where the bright and shiny leaves yield spots of strong light. Let the beginner take a bromide print and go over these lights with soft pencil, leaving say one in ten only, and let those left be grouped together, and he will in this way learn something of the pictorial value of breadth and harmony of general effect.

Miscellaneous Hints on Retouching for **Beginners**

It is important that the beginner be quite used to the reversed effect (position, light and shade) of a negative before he begins retouching. This may be easily acquired by carefully comparing a few negatives with their corresponding prints.

A heavy hand once acquired is very difficult to

get rid of.

If the worker wishes to preserve an upright figure he must have a straight-backed chair of the right height and keep his back firmly against the chair. Sit well back. This keeps the work harmonious. If the worker is too far away the work may be smudgy. To get too near the work

is trying and also bad for the eyesight.

For practice take an old negative, mark a small square, and then work up with the pencil to an even flat tint. Next practise filling up transparent spots, and do not leave this lesson until the spot can be brought to the same density as the surrounding parts without going over the edge.

Blending lights and shades with half-tone is one of the retoucher's most important duties, so that the lights and shades melt into each other without a sharply defined line. Use as little lead as

possible.

The knife is only required by a small proportion of negatives, but the beginner must acquire the art of using it. It should be held lightly. Very, very light shavings are to be attempted. Never under any circumstances should the knife go through the film at one cut. Practice is essential for successful use.

Masks. A set of black paper masks with openings varying from about the size of a quarterdollar upward are very useful for covering all except the part of the negative under considera-

tion.

Media are likely to thicken by slow evaporation. Turpentine may be used to dilute them in such case. The beginner's usual tendency is to use too much medium. Excess may be removed by rubbing with a rag just moistened with turpentine.

Powder media are not to be recommended; not only do they admit of less lead being put on with the pencil, but also they render the negative

unfit for enlarging purposes.

White paper is the best reflector. Mirrors are seldom required. Retouch the strong dense negatives in the middle of the day, reserving the thin ones for the hours when the light is not so strong.

Working by artificial light is somewhat troublesome at first, but a little practice smooths the way. An oil lamp with opal or ground-glass globe comes near the ideal. Electric light and

incandescent gas are too intense.

A thin negative is more difficult to work than one of medium density. Do not forget when making the negative that the tone values must

be preserved.

Do not be content with correcting defects in the face and figure. Many an otherwise satisfactory picture is spoiled by an obtrusive highlight or accessory. The knife will remove objectionable high-lights from furniture, carvings, etc.

In case the background is too assertive, or where it is desired that emphasis be given to make such an object or a piece of statuary stand out from its surroundings, the following procedure may be followed: With a sharp knife cut through the film round the object; soak the negative until the film is quite soft; the offending background film can now easily be removed, leaving clear glass in its place, while the other parts will adhere to the glass.

Working on the Glass Side of the Negative

One must not forget that a negative—like many other problems in life—has two sides, and that both sides may be worked on by the

To prepare the plain glass side to take pencil or crayon, it is coated wholly or in part with matt varnish, i. e., a solution which on drying gives a ground-glass-like surface. When this is quite dry, one can work on it with a soft pencil or crayon. But what is still better is a paper or leather stump and finely powdered lead. economically minded may collect this lead powder from the sandpaper used for sharpening purposes, but the artists' colorman supplies finely ground black crayon powder from five cents per packet up to fifteen cents per bottle; a sixcent tinfoil packet will last the amateur a long time. It is sometimes sold as "stumping chalk 'crayon powder.

or "crayon powder.

The next method of adding density is by means of a layer of fine grain paper, i. e., papier minéral or papier végétal or French tracing paper. To get the paper flat, first place it between

sheets of damp blotting paper; then run a gum line round the edge (glass side) of the negative; press the negative down on the paper. When it is dry the paper will be flat and taut. The paper can then be worked on with pencil, stump, or brush.

A third method is to cut out pieces of tracing paper the exact size of the place requiring strengthening, and fix these to the glass side by means of thin gum or starch paste. This method gives somewhat sharp edges, which may or may not be wanted.

A fourth method is to tint or color matt varnish by dissolving in it a few flakes of iodin or some of the yellow or red dyes. This is then applied to the back of the negative, and the parts not wanted removed by scraping—see below.

A fifth method is to mix water-colors with gum water of moderate strength, and locally apply this to the glass side of the negative. This method is only suitable for small patches, reflections in

water, etc.
So far we have only dealt with methods of adding density generally (tracing paper), or, locally (stumping). We naturally seek for methods of reducing density. On this side of the negative we can only do this indirectly.

Suppose we cover the entire back of a negative with papier minéral, and locally use the stump. The total effect is the addition of a layer of paper all over the negative, plus the addition of some lead or crayon. If now we cut away all the paper except the parts which have been stumped, we still further accentuate the contrast value of the parts of the paper which we leave. Or instead of cutting away the paper, we can render it more transparent by the local application of glycerin, gum water, hard paraffin wax dissolved in kero-In actual practice what is usually sene, etc. found best is, first, to cover the entire negative with paper; then cut away the paper over those parts appearing already quite dense enough, leaving plain paper over those parts requiring slight strengthening; finally to add color or crayon to those parts requiring considerable assistance or reinforcement.

Ordinary tissue paper may be used for large landscape negatives, but, as it is apt to give a

mottled effect, it is better to use either fine tracing

paper or papier minéral.

Of course the foregoing methods may be combined. Thus, in the case of a thin negative with ample detail, one may cover it all over with paper. Then, on the top of this, a second paper may be placed, from which selected portions have been cut away, etc. Some parts may be strengthened with color, others with the pencil or crayon. Parts cut away with a sharp edge, other parts with a finely serrated edge and so on. All this, however, is perhaps not retouching in the ordinary sense of the word, though it may be done with the view of aiding or saving retouching proper.

Practical Hints on Retouching

When using the knife or scraper see that the film is quite dry, the light good, hold the blade at right angles to the film, use a kind of scooping stroke (i. e., beginning and ending gently), and do not try to remove too much at one stroke. Keep the knife edge sharp. Use only as much medium as is necessary. If too much be put on the negative will be tacky and work granular; if too little, the work will be scratchy.

When sharpening the leads use a combined rubbing and rotating movement, and finish off by a few rubs on a bit of ordinary (not smooth)

brown paper.

Do not trouble to spot out pinholes, which come in the shadow parts of the drapery or background, as your spotting is likely to show (in the print) more than the pinhole would had it been left alone.

For spotting use Indian ink, a fine brush, and only just enough moisture to carry the color. If the brush is too wet your spots will be dark circles

with clear centers.

If you have got on all the lead you can on a part already treated with medium, and yet want to get on a little more, then fold up a tube of notepaper and direct a stream of warm breath (breathing slowly) with this tube. This will revive the tooth of the medium and restore its stickiness, when a little more work can be done. The negative must be well dried after this treatment and before printing.

If the negative is very thin use white blotting paper as a reflector; if of moderate density, use smooth white card; if dense, use a mirror reflect-

The first thing to do is to stop out all the pinholes or clear spots (dust spots) which occur in the high-lights and half-tones. This is most important, because if these strong spots of light are left they upset our power of judging density far more than would be supposed. Take a waste negative and hold it up to the light; then with a pin make one or two clear spots in a dense part, and again hold it up to the light. The densities near the spots now seem quite different from what they were before.

(1) Stop out all pinholes, and clear spots and scratches with pencil or brush. (2) Remove freckles and temporary skin markings. (3) Turn the negative upside down; get as far back from the negative as comfortable sight permits, and "even up" patches due to blotches in the skin,

sallow or red markings, sunburn, etc. (4) Now take a trial print and soften exaggerated lines and furrows. (5) Finally, attend to the modelling and do what is needed in the way of softening any undesirable expression.

Rest the brain as well as the eye by having two or three negatives in hand at one time. It is a common mistake to begin and finish a negative straight away. By alternating, our judgment is kept alert, and interest in the work does not flag.

Hints and Jottings

When buying or making a retouching desk bear in mind the following qualifications: (1) It must be firm enough to be free from vibration. (2) It must be large enough to take the largest negative likely to be used. (3) It should be strong enough for the hand and arm to rest upon in safety. (4) It should be capable of being adjusted at various angles. (5) The reflector also should be adjustable in position and angle. (6) It must be so fitted with blinds or shades that the light entering the eye is only that passing through the negative. (7) It should be portable, so that it may be shifted from place to place according to the time of day, season of the year, direction of wind when working at an open window in warm weather, etc. (8) It should fold up into a small space for the convenience of storage when it is "off duty."

For comfortable working at the desk it is necessary that the arm and hand be suitably supported. The best support for the arm is a firm table upon which the desk rests. For the hand some workers use a long thin strip of wood about a foot long, three inches wide, and one-eighth inch thick. There is, however, a danger of this scratching the film. The present writer finds the most comfortable plan is to fold a piece of stout, smooth brown paper into two equal parts and cut out a circular hole about three inches in diameter through both thicknesses, and situated some four or five inches away from the creased edge of the paper. This prevents any heat or moisture from the hand affecting the negative film. Also it can easily be fixed to the desk by the aid of a drawing pin, and readily

shifted about when required.

Formulæ, Hints, etc., for the Retoucher

Dry Retouching Media (in form of fine powder). Finely powdered pumice stone; equal parts of ground cuttle-fish bone and resin; one part fine pumice and two parts powdered resin. In all cases the powders should be sifted through two thicknesses of the finest muslin and then applied with the finger-tip and rubbing in a circular direction.

Liquid Retouching Media. A teaspoonful of powdered resin in half a pint of turpentine. Turpentine, 4 oz.; resin, ½ oz.; gum damar, 60 gr. Turpentine, 2 oz.; oil of spike or lavender, 2 oz.; resin, ½ oz. Alcohol, 2 parts; gum sandarae, 1 parts heavels.

darac, 1 part; benzole, 4 parts; acetone, 2 parts.

Matt Varnish. Ether, 1 oz.; gum sandarac, 50 gr.; Canada balsam, 8 gr.; benzole, ½ oz. Ether, 1 oz.; gum sandarac, 40 gr.; gum mastic, 10 gr.; benzole, $\frac{1}{2}$ oz. Ether, 1 oz.; gum sandarac, 30 gr.; gum mastic, 30 gr.; benzole, $\frac{1}{2}$ oz. The gums are first dissolved in the ether, any sediment in them allowed to settle, and the clear part carefully decanted. The benzole is then added. The quantity of benzole above given yields a moderate grain. By increasing the $\frac{1}{2}$ oz. to 6 drams, a coarser grain (suitable for large work) is obtained. For small portraiture the benzole should be reduced to 2 drams, which yields a correspondingly finer

For Coloring Matt Varnish. Iodin, dragon's

blood, chrysoidin.

To Remove Retouching Varnish. Rub with tuft

of rag moistened with turpentine.

To Remove Matt Varnish. For sharp outlines use a knife and then remove the bulk by rag

dipped in methylated spirit.

To Remove Negative Varnish. Place the negative in a porcelain dish, cover well with methylated spirit. Cover the top of the dish with a sheet of glass, and stand the dish in a second somewhat larger one containing a little hot water. Then rub gently with tuft of cotton-wool.

To Clear Colored Varnish. Ordinary negative varnish or plain collodion may be cleared by adding to it quantum suff. of a strong solution of aurantia in alcohol. This is applied to the glass side of the negative and the parts not wanted removed in the manner above indicated.

Colored Solutions for Modifying Artificial Light. A few crystals of copper sulphate, dissolved in water, gives a green-colored solution, which may be changed to blue by the addition of a few drops of strong ammonia.

Covering Power of Lenses and Stray Light in the Camera

Many photographers, when they purchase a lens, have not the opportunity of testing its performance upon a plate very much larger than that which it is listed to cover, and so do not come to a clear realization of what its properties are in respect to the qualities which commonly go by the name of "covering powers" and "illu-minating power." Generally speaking, it is assumed that covering power of a lens is a property which is to be desired to the fullest extent. The object of these notes is to set forth the doctrine that, within certain limits, the contrary is true, and that while we owe a great deal to the opticians for the progress they have made in providing lenses of great covering power, we have at the same time largely blinded ourselves to the definite advantages of lenses of the older type which exhibit this quality to a much less degree.

It may first be desirable to obtain a practical definition of what is meant by covering power as distinguished from illuminating power. former term relates to the size of plate, or rather to the diameter of field, which a lens of given focal length will cover with sharp definition to the margins when pointed upon a flat subject. The subject requires to be flat, for if it is one consisting of objects at various distances, a lens which possesses what is known as curvature of field may chance to exhibit better performance in the way of covering power than another which actually is superior. On the other hand, illuminating power denotes the size of plate or diameter of field which in the same circumstances, is filled with definition

of a kind. The definition may not be good, but nevertheless the lens will form some kind of image on the plate right up to the edges of the disk which mark the limit of illuminating power.

Now, in the views which are commonly expressed in text-books on photographic optics, it would seem that the more covering power a lens possesses the better it necessarily is. Thus, to quote a passage in one manual on the subject, "the larger the circle covered by a lens of given focal length the better, because the lens can be moved about on the camera front without fear of ill-defined corners in the negative, and also because the lens can be used to cover a larger Undoubtedly this expresses a large measure of truth, inasmuch as the conditions named in it correspond with those which prevail very frequently in practical photography. in an extensive reading of text-books and catalogues dealing with photographic lenses I have rarely found any attention given to the effects which different lenses produce in these matters of covering power and illuminating power. While it is true that ample covering power has its advantages when you use the camera with the lens raised or lowered, or when you seek to cover a larger plate, it is perhaps not so clearly kept in mind that when you are not using a lens under these conditions the reserve of covering power is not then negatived or annulled, but has its effect in the way of illuminating the bellows of the camera, thereby creating a source of stray light within the camera which is a cause of many complaints of veil or flatness in negatives. This effect, of course, takes place equally whether it comes from great covering power of the lens or from its wide "circle of illumination." So far as concerns the creation of stray light within the camera, it doesn't matter whether the illumination of the bellows is due to the margins of an unsharp or a sharp image. The effect is just the same in producing a secondary source of light within the camera which, in the absence of means to cut it out, must have its effect upon the plate.

The outcome of these considerations is that for many of the purposes which come in the category of ordinary photography a lens of covering power such that its field extends very little beyond the dimensions of the plate will prove in practice to yield results which are thoroughly comparable with those by an anastigmat costing a good deal more. This applies to such work as copying, photography of ordinary views, and in general to subjects where (1) there is no call to bring the lens out of center with the plate, and (2) where it is not necessary to work at a very rapid aperture. The anastigmat, with its large working aperture and its ability at that aperture to cover a relatively large plate, has tended to render us less appreciative of the results which can be obtained with the now despised R. R. type of lens in circumstances where one or other of these two conditions does not require to be fulfilled. It is true that the definition toward the margins of a plate yielded by an R. R. lens at its full aperture compares unfavorably with that of an anastigmat at *its* full aperture. But when both lenses are stopped down to a medium aperture, such as f/16 or f/22, the difference in the performance of the two largely disappears, and in

these circumstances the R. R., from its lesser degree of covering power and smaller circle of illumination, scores on the ground of yielding negatives of a degree of brilliance and sparkle which often it is difficult to secure with an anastigmat of similar focal length. I have no doubt I am telling a tale which is familiar enough to those who have lived through the era in photographic lenses which includes the coming of those of the anastigmat type. Old hands who have had the occasion and opportunity to compare the actual performance of the newer lenses with those which previously were their accustomed instruments and under the conditions formerly applying to those instruments, have discovered for themselves that the merit of the anastigmat-let there be no thought of disparaging it-lies in the direction of creating better performance under fresh conditions which they render possible, rather than in improving the quality of work such as one was accustomed to turn out in the days when the R.R. was the universal lens and its limitations

were recognized.

The moral of all this—and it is one which may not inappropriately be drawn to the notice of photographers in these days, when it is difficult to purchase anastigmat lenses—is that the precise purpose for which a lens is to be used should be carefully considered. It is not advisable to jump to the conclusion that an anastigmat, if it can be got, is necessarily going to do any better work than an R. R. of the same focal length. Probably it would surprise many of those who imagine that the anastigmat is the lens par excellence for copying to observe in process studios the frequency with which an R.R. figures on the copying camera. Moreover, the choice of an anastigmat of large aperture is apt to be particularly elusive when one of considerable focal length, such as 10 inches and more, comes to be purchased. Here another factor quite apart from that of covering power comes into play, namely, depth of focus. Assuming broadly that the depth of focus which is commonly called for in negatives is conditioned by the actual diameter of the lens stop (not by the f/ number), it will be seen that in using a longfocus lens it is generally necessary to use a medium or even a small stop to secure sufficient depth of focus. Obviously, then, there can be no useful purpose served in buying an expensive lens which works at f/4.5, when, for 90 per cent. of the subjects which are photographed with it, it requires to be stopped down to f/16 or f/22simply for the purpose of obtaining sharp defini-tion. This, again, is a point which I am sure is familiar to photographers who have had much experience in the use of long-focus lenses in general outdoor photography. It is another of those instances which leads one to the general conclusion that in photographic optical equipment, as in that for other crafts such as wood-work or metal-working, it is a bad practice to endeavor to make one tool serve several purwhile the anastigmat, with its large aperture and its great covering power, has its specific usefulness, the older type of lesser speed and lower covering power equally is unexcelled, as regards all-round quality of work, for certain purposes.-British Journal of Photography.

Qualitative Tests for the More Common Developers

SPEAKING broadly, one may say that all the photographic developers are intermediate products for the manufacture of dyestuffs, or else easily prepared derivatives of these intermediate products. Consequently, when the Allies turned to the manufacture of their own dyestuffs, it was but natural that some attention should be given to the manufacture of developers. The older developers, pyrogallic acid and hydroquinone, although no longer of German origin, have retained their former names, as have also para-amidophenol and its solution, rodinal, but there appears to be a strong feeling against the perpetuation of the German-made names, metol and amidol.

Hence we are met in the advertisement columns of the photographic journals by a number of new developer names, some of them new names for previously known substances, some of them, such as Monomet, announcing the appearance of an entirely new body.

The photographer who likes to know exactly what he is using in the way of developer will naturally wish to examine into the nature of the bodies thus presented to his notice, and he will meet with some difficulty in satisfying his legitimate curiosity, owing to the very scanty literature on the subject.

The following notes may make his researches

little easier for the future.

Practically the only developers on the market at present are: Pyrogallic acid; hydroquinone; p-amidophenol (rodinal and similar solutions): monomet; amidol (diamidophenol); metol (methyl-para-amido-phenol).

The reagents required are: 10 per cent. solution of sodium sulphite, sodium carbonate sodium hydroxide, sulphuric acid; 30 per cent. solution of sodium nitrite; 1 per cent. solutions of ferric chloride and of bichromate of soda or potash; and 95 per cent. alcohol. (Methylated spirit will do.)

Test No. 1. Shake up a small quantity of the dry developer in a test-tube with a little alcohol. Pyro and hydroquinone are freely soluble. The other four slightly or not at all soluble.

Test No. 2. Make an approximately 1 per cent. solution of the developer, and add sodium sulphite solution. Monomet and amidophenol hydrochloride give a white precipitate at once; soluble in caustic soda. Metol and amidol will give crystalline precipitates, slowly forming from 10 per cent. solutions, but not from 1 per cent. solutions. Pyro and hydroquinone are not precipitated.

Test No. 3. To a 1 per cent. solution of the substance, add sodium carbonate solution. Monomet and amidophenol are precipitated as in test No. 2, but the liquid gradually turns brown. Metol is not precipitated, but the solution turns brown; the precipitates are soluble in caustic soda. Amidol gives a bright blue solution, which turns green on dilution.

Test No. 4. Make a strong solution of the

Test No. 4. Make a strong solution of the substance in the dilute sulphuric acid, cool well, and add a few drops of the sodium nitrite solution. Metol gives a yellowish crystalline precipitate,

either at once if the solution is very strong, or after a few moments if more dilute. None of the

other developers give a precipitate.

Test No. 5. To a 1 per cent. solution of the substance add a few drops of the ferric chloride Hydroquinone gives a yellowish solution. precipitate, which may turn dark green (quin-hydrone) if the solutions are too strong. Pyro gives a brown color. Amidophenol gives a chocolate-brown precipitate. Monomet gives a brown solution, turning purple. Metol gives a bright claret color. Amidol gives a bright claret color.

Test No. 6. To a 1 per cent. solution of the substance add a few drops of the ferric chloride solution. Hydroquinone, no change. brown, turbid. Amidophenol, bluish purple. Monomet, brown, turning purple. Metol, reddish brown. Amidol, brown, turning purple.

When we have to deal with a single developer the above test will be found quite reliable; but when we come to examine a mixture, such as metol-hydroquinone, pyromonomet, etc., difficulties begin to appear. Usually, however, the two ingredients may be separated by shaking up the finely powdered substance with two or three small portions of alcohol, filtering or decanting the alcoholic extract, and allowing it to evaporate completely before making the tests on the soluble and insoluble portions respectively.

Liquid developers fall into two classes. We have mixtures such as M-Q, and solutions after the nature of rodinal, which is amidophenol hydrochloride dissolved in a strong solution of sodium sulphite and hydroxide. Perhaps the simplest method of attacking this problem is to add dilute hydrochloric acid drop by drop until

effervescence ceases.

A developer of the M-Q class remains clear; if the liquid contains amidophenol, a white precipitate will form as soon as acid is added, which will redissolve when the acid is in excess.

The acidified liquid is now evaporated to dryness on a water-bath, or a soup plate on a pan of briskly boiling water. When the smell of hydrochloric acid has disappeared the white crystalline residue is submitted to the tests given

above.

From the mode of its production, metol is always apt to contain more or less amidophenol. If this is not present in large amount, tests Nos. 2 and 3 may not indicate the contamination, while the positive test, No. 4, for methyl paraamidophenol is not interfered with. The most certain indication of the presence of amidophenol is obtained as follows: The suspected sample is dissolved in water, and is mixed with a strong solution of sodium acetate. One drop of benzaldehyde is next added, and the mixture gently shaken. The presence of amidophenol is indicated by the formation of a curdy white precipitate. By suitably regulating the conditions of the experiment, this test may be made strictly quantitative.—W. Ermen, in British Journal of Photography.

Small Economies

ECONOMY in photographic work, as in many other directions, is not only a virtue, but with

some it is an absolute necessity. Many of those who speak of photography as an expensive hobby are led to consider it so by following it in an unnecessarily wasteful and extravagant manner. Otherwise they could not fairly hold such an opinion. It will be helpful to suggest one or two directions in which economy can be practised with advantage.

A fruitful source of waste is the laying aside of odd plates and partially used packets of paper, with the result that if an attempt is made to use them later on it is found that they have deteriorated so as to be almost or entirely useless. Let us consider a special case and the way to deal with it, and then apply the idea to similar

A photographer makes a lantern slide or two occasionally, perhaps at considerable intervals. He buys a box of a dozen plates. Instead of tearing off the outside wrapper he should run a sharp penknife round the middle, and slide the wrapper off in two halves. Having used the plates required he should leave the remainder in their original wrappings in the box, slide on the outer cover, and mark on the outside the number of plates still in the box. It should then be placed in a tin box, such, for example, as biscuits are sold in, and a strip of surgical strappings run round to seal the crevice between the lid and the sides. Such a storage box will contain any odd lots of plates that are not wanted for early use. A similar box, preferably larger and flatter, should be provided for opened packets of paper. Before packing these away each may be sealed up with a slip of gummed paper, and marked with the number of sheets contained. On the outside of both the plate and the paper storage tin should be stuck a piece of paper with an index to the contents. This will require correction each time the box is opened and some of its contents used, and when necessary a new contents sheet may be pasted over the old one.

In the case of chemicals, it should be ascertained which keep best in solid form and which in solution, and in all cases where deterioration is inevitable a date should be affixed as a guide. Some liquids require cork, others rubber, and others glass, as a stopper for the bottle. A few must be stored in the dark. All chemicals, whether solid or liquid, should be distinctly labelled to avoid waste through using the wrong thing by mistake. In many cases a saving is effected by keeping chemicals in such a way-10 per cent. solutions, for example—that small quantities can be made up as required from time to time, rather than preparing a larger quantity, the unused remainder of which may deteriorate

before it is wanted.

Apparatus should be handled with care at all times, and when not in use should be stored so that it does not suffer in any way, particularly from damp. The life of a camera is surprisingly longer in careful hands, even when in constant use, than when it is roughly handled and exposed to heat, damp, and dust. A case for a camera or a lens saves its own cost many times over. Small repairs and occasional renovation should not be neglected.

The same idea applies to accessories. washing tank that is inverted to drain after every occasion it has been used will outlast half a dozen that are put away wet. A printing frame that has been warped by heat or damp is not only useless but positively dangerous. Dishes, measures, paste brushes, and so on should be thoroughly cleansed immediately they are done

A word may be added as to economy in purchasing. It is false economy to purchase an inferior article of any kind simply because the price is lower than that of a reliable and satisfactory one. As a rule, too, it is better to buy material—plates, papers, chemicals, paste, etc.in small quantities and often, so that they may be as fresh as possible. Larger-sized plates and papers can generally be purchased in half-dozens

sufficient for immediate needs it is preferable to the larger.

Perhaps these few suggestions are sufficient to illustrate the general idea of small economics; and although they may fairly be described as small when taken individually, they amount to something very considerable in the aggregate. Moreover, apart from actual economy they one and all make for better work.—*Photography*.

as well as in dozens, and if the smaller number is

The Hypo Scarcity: What to Do about It

According to our information the present scarcity of hypo is not so serious as to amount to a famine. Floating supplies are undoubtedly small, but no doubt photographers generally warned by previous shortages have taken the occasion to provide themselves with stocks sufficient to tide them over such periods as the present. At the same time there is the shortage, and the question requires to be answered how it shall be best dealt with with, a view not merely to the present juncture but also to that of similar happenings in the future. Before dealing in turn with several points we wish to be allowed to say that one thing which most certainly should not be done is to scamp the use of hypo and thereby to issue prints the permanency of which is a question of weeks or months. It would be a thousand pities that the shortage of an essential material should prompt such a course as this. Photographs at the present day enjoy a deserved reputation for a very fair degree of permanence. It would be far better to make them very much more costly things than to endeavor to make an insufficient supply of hypo go round by stinting

It must be remembered that there is no workable substitute for hypo in the fixation of plates or prints; and there is no substance which can be added to hypo in order to make it "go further." Additions such as ammonium chloride (salammoniac) have the effect of making a fixing bath quicker in action, but they do not allow of a larger number of plates or prints being fixed with a given weight of hypo. Therefore a photographer's consideration at the present juncture requires to be of the practical ways and means which can be adopted for reducing wastage of hypo. Apart from such sheer waste as occurs in handling the solid chemical—which we think is negligible and may be at once put on one side—wastage of hypo consists in discarding fixing baths before they

have done as much work as they are capable of. How then are baths to do more fixing work without prejudice to the quality and permanence of the results? Broadly, there are four ways in which a fixing bath, as it is commonly used, could be better employed. These are:

1. Rinsing between development and fixing.

 Testing for degree of exhaustion.
 Passing on print fixers for use with plates. 4. Keeping at suitable temperature.

These provisions apply broadly both to negatives and prints, but their application is naturally more in respect to prints, for the reason that prints occupy a much larger proportion of a photographer's output and call for more careful supervision as regards fixing. We will now take these four points in succession and endeavor to indicate simple procedures which photographers and their assistants can and should adopt as a means of economy in the essential hyposulphite.

1. Rinsing after Development. This applies particularly to prints, since rinsing the developer from the surface of a print very greatly reduces contamination of the hypo bath by developer, with its effects of stain and, in aggravated cases, of muddiness in prints. In the case of papers such as bromide, which are fixed in a plain, as distinguished from an acid, bath, the omission to rinse prints before placing in the fixer will often cause the hypo bath to develop a strong color long before its fixing powers are approaching exhaustion. Plainly, economy in hypo will result, under these conditions, from cleansing the prints from developer before they go into the fixer. In the case of prints of the gaslight type, which usually are treated in an acid fixing bath, a brief washoff of developer is in a somewhat different With some gaslight papers it is essential to use an acid fixing bath, and when that is the case there is not much advantage in rinsing after development. In fact some papers will not stand such rinsing but yield yellow stains unless plunged immediately into the fixer. On the other hand, some gaslight prints will bear fixing even in a plain hypo bath, and at the same time will not suffer by receiving a brief rinse between development and fixing. We advise photographers to discover for themselves just what the brand of paper which they are using will allow, and then, if practicable, rinse between development and fixing; also, again if practicable, fix in a plain instead of an acid bath. Hypo in plain solution goes further than in any other form.

2. Testing Exhaustion. In the case of plates, we can see for ourselves by the slowness with which they clear that the fixing bath is nearing the end of its tether; in the case of prints no such evidence is afforded, and it is here that some working test is necessary to show how the fixing bath is getting on and to avoid discarding it while it still retains ample fixing powers. A test of this kind which anyone can apply for himself

is as follows:

A few ordinary dry plates—any make, any grade—are cut up into slips, of, say, one-inch widths and three- or four-inch lengths. It doesn't matter whether the plates are fresh or stale, nor is it a question of any great importance whether they have been exposed to daylight before being used for the test. Preferably they should not be exposed more than necessary. Our own practice is to cut up the plates by a bright yellow light in the dark-room and then to keep the slips (without any wrappings) in a plate box. The exposure to light which they get in the print-fixing room, when taking out a single slip, will not do any harm. One of these slips is then put into the fixing bath, which has been in use for a larger or smaller number of prints, and a note taken of the time required for the white emulsion to dissolve out. If this time requires to be longer than ten minutes the bath may be discarded, at any rate for fixing further prints, and it may be said that the test, rough as it is, is a pretty fair indication that hypo in the bath has been used up so far as is advisable without risking the permanence of prints. Our opinion is that a method of testing, such as just described, is a better system than allotting so much hypo to fix such-and-such a number of prints or postcards. We think that a system of allowing, say one pound of hypo for 150 postcards (to quote figures which were recommended a year or two ago by one maker of postcards) is more likely to lead to wastage of hypo than the use of an actual test. Moreover, where large quantities of prints are being put through it is not so readily applied.

3. Print Fixer for Plates. Inasmuch as almost all development papers can now be fixed in a bath containing four or five ounces of hypo per twenty ounces of water without ill-effect in the way of blisters, it is often possible to pass on the fixing baths (which have done duty for prints) for subsequent use in fixing negatives. But discretion requires to be used. Plainly, it will not do to risk impermanence of negatives for a few ounces of hypo. Plates differ in quite a marked manner as regards the "cleanness" with which they fix out in a bath which is getting near to the "off-strength" point; and it is open to serious doubt whether some plates will fix completely at all if they require to be longer in the fixing bath than, say, fifteen or twenty minutes before the white emulsion disappears. Therefore, in using baths which have been employed for prints an eye should be kept on this point. In any case such baths should be used in tanks, not dishes, in order that a large number of negatives may be fixed together and time thus economized; and further, the fixing bath requires to be kept up to a

reasonable working temperature.
4. Temperature. This brings us to our last point, which is that the fixing bath, whether for plates or prints, should not be below 60° or 65° in temperature. The temperature should be tested with a thermometer, not guessed, and the bath requires to be kept at this temperature. In the cold dark-rooms which, we fear, in many establishments are the rule, artificial heat is necessary for this purpose. In the case of dishes, it is unsafe to warm by placing the dish directly over (even if some distance above) a moderate source of heat, such as a small ring gas-burner turned down to the blue. In such circumstances it is almost inevitable that the fixing solution will not be uniformly heated. If it is left to itself for a while it can easily happen that it will get too warm in places, and may lead to softening or melting of the emulsion coating on prints sufficient to spoil the prints at this stage or to give rise to blistering in the after-process of sulphide toning. Some means should be taken to distribute and equalize the heat. This may be done by standing the fixing-dish in a large baking-tin containing clean sand or fine shot to the depth of about a quarter of an inch, or by placing the fixing-dish in a larger dish containing water. Still more necessary is it to ensure uniform distribution of heat, so far as possible, in the case of fixing tanks, which require to be stood in a larger metal tank—an old washer can often be requisitioned for the purpose—filled with water above the level of the hypo solution in the fixing tank. By taking means such as these, in the case of either dishes or tanks, it requires little ingenuity to adapt any convenient source of heat, such as a ring gasburner, a small oil stove, or a single paraffin lamp, to keep the fixing solution at a temperature which will make the best of its fixing powers.

There are several other minor measures which should be observed in the economical use of hypo. In making up fixing baths the hypo crystals should be weighed, or measured by bulk. In the days when hypo was the cheapest of commodities it was too commonly the practice to make up baths simply by shovelling the crystals by the handful into the water for their solution.

Another point is that, in transferring prints from the fixing bath to the first wash water a great deal of hypo solution can be carried away and lost. It would probably surprise anyone who cares to make the experiment to find how much fixing bath can be collected from a batch of prints simply by allowing the drippings, which usually find their way to the wash water, to accumulate. If prints are drawn slowly from the fixing bath the greater proportion of the solution will be drawn away from the surface and will be kept in the bath.

But perhaps more important than any of these minor measures is the practice of keeping prints constantly on the move while in the fixing bath. Hypo does its work quickly and surely and without waste, but not unless the hypo solution is brought freely into contact with the surfaces of prints and is given the opportunity of penetrating into the pores of the emulsion, while at the same time the solution charged with the silver salts from the emulsion can pass out into the surrounding bath. If this essential feature of the fixing process were kept regularly in mind we should hear less of complaints of stains and the

e from incomplete fixing.—British Journal of Photography.

Some Peculiarities of Color and Their Bearing on Photographic Work¹

LIGHT falling upon an object to be photographed is reflected from the surface, but we are concerned not merely with the light which is reflected at the actual surface of the object, but also with the light which penetrates a little way into the substance and is reflected as it were from the inside of the material. The depth of penetration of the light may be very slight, but pro-

¹ A lecture delivered before the Royal Photographic Society.

vided that the light penetrates the object at all and goes a little way through the substance, that light is subjected to the effect of selective absorption. If the whole of the visible light is reflected, then we say that the object is white, but it may very well happen that some of the constituents of the light are absorbed, and then we speak of the light which is sent back to the eye as colored, because it is white light less some of its colored

constituents.

Colors produced in this way by selective absorption have varying properties and I will show an experiment to demonstrate some of the differences that exist. We take a solution of potassium permanganate, and place it in the path of a beam of light, and in the path of another beam we place a solution of one-tenth the strength. There is a difference in brilliancy and also in color. By stopping down the lens through which the brighter beam is passing we bring our two images roughly to the same brilliancy, and then it is seen that there is a decided difference in color: one is a blue while the other is pink. Here is a case where the color of the light which has passed through an absorbing medium differs in quality with the strength of that medium.

If we now place in the path of one beam a solution of picric acid and in the path of the other beam a solution diluted ten times with water, we shall see that while the dilute solution allows more light to go through, the change in color is not so great, and if we reduce the amount of light passing through the lighter solution, we see that the difference in color produced by the effect of

dilution is but slight.

If a piece of yellow film is placed half-way across the spectrum, then it will be seen that the reason why the dilution of the pieric acid solution produces so little change in its color is that yellow is opaque to blue and to violet light, while it is, on the other hand, very transparent to the remaining constituents of white light. In such a case, when by selective absorption one constituent of the white light is completely removed and the remaining constituents are allowed to pass in considerable quantity, then not much change is obtained in the color, whether the solution is strong or weak.

We are aware, of course, that all ordinary colors are produced by removal of some of the constituents of white light by selective absorption; but it does not follow that this occurs very often. In a large number of cases the absorption is more or less gradual, and then the effects are

more complicated.

The fact that yellow is a compound color and is produced by the abstraction of the blue-violet constituents of the white light, and that the removal of those constituents is very often complete, is a phenomenon which has many bearings

on photographic work.

Safe-lights, which are used in the wet-collodion process, are a bright yellow. Wet plate work is conducted under modern conditions of process engraving in a room which is well lighted, and this is possible partly because of the efficiency of the safe-lights. It is easy to construct safelights which remove the whole of the blue-violet and ultra-violet light, and allow to pass all those brilliant red, yellow, and green rays which give

to the eye the effect of yellow. The efficiency of orthochromatic filters also is affected considerably by this point. Ordinary yellow filters for orthochromatic work are very efficient. The amount of light of longer wave-lengths—the red and green light—which they obstruct is very slight, but by using the dye in suitable quantities one may grade down the blue light just to the

extent which is required.

I show now a photograph of some buttercups on a wet collodion plate as used by the process engraver. The brilliant yellow flowers are rendered as black, the reason being that the petals of the buttercups do not return to the camera any of the light to which that plate is sensitive, and this point is, perhaps, a little remarkable because it is only occasionally that one gets the whole of the blue and violet light so completely removed that it cannot produce any effect at all upon the

ordinary photographic plate.

Now we come to a group of subjects which show this effect most markedly. These are objects which are varnished with a yellow varnish. In these cases the actual varnish lying on the top of the wood or the oil-painting very often plays a most striking part in the result. The varnish is itself somewhat yellow, but the light which falls upon it is partly reflected at the topmost surface. One thus gets a considerable amount of surface reflection, much of it being regular. That light is white, it therefore contains the blue and violet constituents which affect the ordinary photographic plate, so that an object of this type, when photographed on an ordinary plate, is recorded chiefly by part of the surface-reflected light. If, however, we photograph by the longer wavelengths, we get a record of what is under the yellow varnished screen.

I have one case in which the object can only be photographed by light which passes through it. It is a piece of old Kauri gum containing some insects. The rendering with the ordinary plate shows no sign whatever of the insects. It is the complete removal by selective absorption of all the light to which the ordinary photographic plate is sensitive which produces this result. When, however, this same object is photographed by the longer wave-lengths of red, yellow, and green, then we are able to obtain a record of what is inside the substance, and the insects are plainly visible. There is always that difference between the two cases. When one is photographing an object by reflected light, then whatever kind of light is used for taking the photograph, one can always obtain some sort of result, but as in the photography of insects in amber, where the light has to penetrate through the material, if selective absorption by a yellowcolored material occurs, then it may mean that the light which is ordinarily used for photographic work is removed. Although some of these instances may seem commonplace, I emphasize them because the peculiarities of yellow are not those of many colors.

Let us now turn to the question of greens, which do not act in quite the same way as yellow. If we take any green dye and place it in the path of the light, we shall find that, while it produces its effect by selective absorption—that is to say, by the removal of some of the con-

stituents of the white light—there is, nevertheless, the difference that it does not transmit

the whole of the green light.

That is quite a common characteristic of green, more so than one might at first suppose. If the greens that occur in nature are examined it will be found that in practically every case they do not return anything like the whole of the green light which falls on them back into the air, and in many cases, especially if we were to try the experiment with such green leaves as are now (December) available, we should find that the reflection of green light only amounts to 4 or 5 per cent. In no case does the reflection of green from the green leaf amount to more than one-Yellow and blue make green, but the third. green filters for photographic work do not admit of the same efficient construction as do the yellow filters, and the reason is that we have not in the case of blues a color which acts in the same way. In the case of the blues and the greens we do not have a complete absorption of any one color and an efficient transmission of the remaining colors. We are here dealing with a class of colors which are apt to change according to their strength.

I show a photograph on the screen of a landscape in which the leaves on the trees give no evidence of detail upon the exposed under surfaces, whereas the upper surfaces are only too well exposed. Here we are dealing with the effect of surface reflection. The leaves are spread out in the way that nature has provided so as to catch as much of the sun's rays as possible. The solar light, falling on this leaf, is reflected to some extent at the surface, and that surface reflection, comprising as it does every kind of light which the sun has sent to the leaf, has among its components just those particular wave-lengths which affect the photographic plate, and so this is well exposed. But the light which penetrates the leaf has undergone selective absorption, and it so happens that almost the whole of the light which affects the photographic plate has been removed by that selective absorption. If we photograph the same object again, using light which comprises green among its components, we shall be able to photograph the detail of the under sides of leaves, and in this case we no longer have the violent contrast between the surface reflection and the dark under side of the leaf, because the green light is being photographically recorded.

There are two cases of selective absorption in marked contrast. We have, on the one hand, the case where some light absorbed is absorbed very completely, and other light is transmitted almost in its entirety. On the other hand, we have the more common case where no one constituent of the white light is completely absorbed and no one constituent completely transmitted. It is very fortunate—indeed, there is probably a great natural law behind it—that it is in some of the useful cases that there is complete absorption and high transmission. Complete absorption is only combined with high transmission in those cases in which it is the shorter wave-lengths which are absorbed and the longer wave-lengths which are transmitted. In all other cases we have nothing so definite.—A. J. Bull, in *British Journal of* Photography.

The Use of Old Plates

It has been said that plates are made to be used, not kept: and, while such an observation is true enough, the suggestion underlying it—that the subject of keeping plates is of no practical importance to the photographer—is not true. Few of us can foresee our requirements with sufficient accuracy to dispense with any stock of plates at all; nor, as we shall proceed to show, is there any necessity whatever to do so.

Considering their extreme sensitiveness to light, it is one of the most remarkable facts about gelatino-bromide plates that they are so hardy in almost all other respects. Their keeping properties are seldom fully appreciated. We have often used plates which have been lying by for a couple of years; we have made first-class negatives on plates which have gone two sea voyages each of four weeks' duration, at intervals of a year, the plates at the time of exposure having left their makers' hands over five years. In these cases no special precautions whatever were taken: there was no extra packing, hermetic sealing, or tin-lined boxes. The plates were just kept in a drawer, so as to be at hand when required. We mention these, as they are examples within our own knowledge; there are many other instances on record in which these times have been very greatly exceeded, and we ask those who read these lines and have kept plates unaltered for a few years not to go to the trouble to write and sav so, as the fact that they do keep is now quite sufficiently established.

It is safe to say that a properly made dry plate does not bear within itself the seed of deterioration. If it is protected from all adverse influences from without it will remain as good as ever for any time within reason. The agent most likely to be harmful is damp. Many do not realize how damp will make its way into closed receptacles and injure their contents. We had occasion recently to turn out two or three biscuit tins which contained lantern slides, and had been kept in a damp cupboard for a couple of years. In spite of well-fitting lids, the bindings of the slides were mouldy and rotten in many cases, and mildew had actually made its way onto the film of the slides themselves. In such a store cupboard it would be unreasonable to expect plates to keep without deterioration. But it is easy to avoid damp such as this without taking any very elaborate precautions. A room that is dry enough to be ordinarily habitable is all that is required.

A more insidious foe than damp is the product of burning gas. The sulphur compounds present in gas fumes attack the silver bromide very readily; and in most cases in which plates have suffered from being kept it is to such compounds that we must look for the source of the mischief. One may live long in a room and never know how foul some of the air is in this respect; but if for any purpose a step-ladder is mounted, the air near the ceiling is found to be both hot and smelly if gas has been burning long and there is no ventilator at the extreme top. The moral of all this is that anything likely to be affected by such fumes should not be kept on a high shelf; it should be so low that if the air were

impure it would be noticed at once.

The effect of such fumes upon plates is to cause them to fog in the developer if the effect is only slight, but if it is an aggravated case the fog is visible upon the plates before they are developed at all. The action of sulphuretted hydrogen, such as is given off by sodium sulphide, etc., is very similar; but being generally much more concentrated, it is more quickly harmful.

Sensitive materials should therefore always be stored where there is no possibility of it reaching them. As the fumes make their way in from outside, it is the margins of the plates which are first attacked; and one may very often see in such a case, even before development, an irregular band of iridescent metallic-looking fog extending from the edges inward for perhaps half an inch

or more.

In such cases it does not follow that the whole of the plate is spoiled; one can often use plates that have deteriorated badly for work where only the middle part of the negative is likely to be required. It may be necessary to add bromide to the developer, say, to the extent of a grain of potassium bromide to each ounce of the solution; but by taking care to give a very full exposure, and not to be misled by the longer time taken for development, this has no inconveniences.

Why should I keep any plates? the reader may ask. There are several reasons. Except for the difficulty of getting plates quickly, there is no reason why one of the less popular sizes should be used if preferred. A stock of plates can be bought and used as required, being replenished every six or twelve months as may be necessary. This has the advantage that all the plates used during a long period are from the same batch of emulsion, and so are uniform in speed and development characteristics. Some brands are very constant; but there are others which, as our readers know, vary considerably from time to time.

This article may perhaps have another value. Job lines of unguaranteed plates are often to be bought very cheaply; and it may encourage some to see if they can effect any economy in that direction. For home use, where, if one plate turns out to be bad, it is not much trouble to substitute another; such cheap plates can often be used. We know photographers whose enlarged negatives are always made on plates so obtained; and the saving in large sizes is very appreciable, not only because large sizes are expensive at any time, but also because there being little demand for such sizes in odd lots, the reduction is usually in a much greater ratio than with smaller and more popular sizes. For such work we should not hesitate to buy a cheap lot if they were of a standard make, and if we knew the seller to be a responsible dealer whose only reason for disposing of them was that they had been for a long while in stock.—Photography.

Centering Films in the Enlarger Carrier

Due to the extreme popularity of vest-pocket cameras, a great number of small film negatives

are enlarged in quarter-plate and bigger enlargers. The usual way of securing these is to clip them between two pieces of thin glass, such as old, well-cleaned negative glasses. When this method is followed, often it is difficult to get the tiny negative—usually curling and twisting in annoying fashion—squarely and accurately centered between the two glasses, without the expenditure of considerable time and patience. Another objection, too, is the large area of white light surrounding the projected image, light which, unless screened, often has disastrous lightfogging effect on the bromide paper. If only one or two sizes of film are enlarged a good plan is to cover one of the glass frames with black paper, out of which a rectangle the required size is cut. When this is glued down on the glass the negative fits snugly into its little recess without any trouble or time-wasting manipulation.—Amateur Photographer.

For Bromide Printers

It frequently happens when printing on bromide or gaslight paper that a negative accidentally gets spotted, wetted, or fingered with solution, and especially when dark-room accommodation is limited and negatives cannot be kept well away from the solutions. These defects are very difficult if not impossible of removal, and ruin the negative. It will be found a good plan when printing from a number of negatives to expose all the paper, and then put the exposed sheets of paper very carefully away in a packet or drawer, and develop the whole batch at once, thus doing away with any possibility of the danger referred to above. If the exposure is known for each negative, as it will be by a methodical worker, this is by far the best method, and when a large number of prints are being made saves very considerably in the matter of speed. Several prints may be developed together, using plenty of solution, thus making a further saving in time. Gaslight papers may also be manipulated in the same way with equal success.—Amateur Photographer.

Photographing Animals

One of the secrets of success in this branch of work is in catching and retaining for a moment the attention of the animal. This can usually be done by making a suitable noise. *Dogs*—the buzz of a bee or mew of a cat. *Cats*—a scratching noise, such as one can make by drawing a pin over rough paper. Young cats are usually attracted by slowly moving a feather attached to a bit of thread. *Cows* generally pay notice to the well-imitated bark of a dog. Sheep are similarly attracted, but in their case the noise if too loud will set them on the run. *Horses* can usually be attracted by a shrill whistle. It has been stated that horses can hear a lower note than that barely audible to human ears. *Poultry*—everyone is familiar with the clucking sound usually made in the farmyard by those who feed the fowls.—*Amateur Photographer*.

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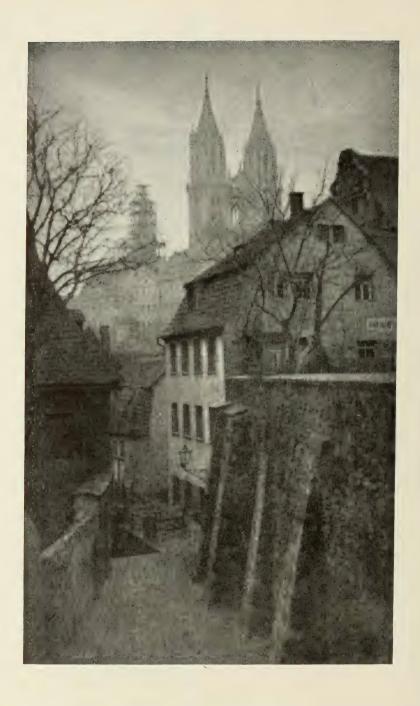
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SOME MINOR PROCESSES OF PHOTOGRAPHY

By C. H. BOTHAMLEY, M.Sc., F.I.C.

R. J. TRAILL-TAYLOR, in whose memory this lecture was founded, had an intimate acquaintance with all branches of photography as it existed in his day. He made a special study of photographic optics at a time when that branch of knowledge was comparatively neglected in this country, and consequently his name has always been associated more particularly with those studies. I believe it is correct to say that almost all the previous memorial lectures have dealt with some section of optical phenomena, or, at any rate, with some branch of physics. Mr. Taylor's knowledge and sympathies were, however, by no means so restricted. Those who knew him will remember that he was keenly interested in all the details of photographic practice and had an almost uncanny acquaintance with the origin and history of various processes. He never laid claim to chemical

¹ The Twentieth Traill-Taylor Memorial Lecture delivered before the Royal Photographic Society.

knowledge, and I was never able to find out to what extent he was a chemist but it is noteworthy that his name appears as the responsible editor of the last edition of Hardwich's *Photographic Chemistry*, a book which is still of considerable interest, and a careful perusal of which might lead to some "new discoveries," just as the malicious used to allege thirty or forty years ago that certain alleged discoveries in chemistry were merely the results of diligent excavation in the mine of forgotten information contained in Gmelin's great *Handbook of Chemistry*.

It was consideration of these facts that led me to think, when I accepted the honor of the invitation to deliver this lecture, that it would not be inappropriate to bring before you certain matters concerning processes which are of everyday utility. Had I known eighteen months ago of the extent to which I should be hampered by those difficulties of office staff and increased work which the war has brought to so

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many of us, I should, I admit, have hesitated to accept the invitation, and I have to beg your indulgence if some of my experiments seem to be incomplete, and to ask you to regard the results as preliminary only. Later on I hope to be able to carry the work farther in certain directions.

I propose to deal with three wellknown processes—namely (1) reduction with alkali persulphates; (2) intensification with the aid of potassium bichromate; and (3) intensification and "toning" with potassium ferricyanide as the intermediary, my object being to clear up certain discrepancies between published statements and to ascertain what are the real essentials to successful To this end I have taken working. special care to use chemicals of a very high degree of purity, and to wash all soluble salts out of the negative or positives experimented on, using carefully distilled water for the final washings. The last wash-water was always tested afrer it had been in contact with the film for some time.

The negatives (or positives) experimented with were a very mixed lot of subjects; many of them were not made by me, and many of them were several years old. Some had been developed with pyro-soda, some with hydro-quinone, and some with metol-hydro-quinone, so that, as a whole, they provided sufficient variety. All were soaked in water for at least twenty-four hours before being treated with any chemical reagent.

The strip negatives made in the course of the experiments were developed with diamidophenol and sodium sul-

phite without bromide.

Ammonium Persulphate

The alkali persulphates were first prepared in 1891 by the late Dr. Hugh Marshall, who observed that their properties included the power, when in aqueous solution, of dissolving finely divided silver by converting it into silver sulphate, the alkali persulphate being reduced to sulphate at the same time. It was observed later that this change goes on more rapidly after some silver

has already passed into solution, and the rate of the reaction can be markedly accelerated from the outset if a small quantity of a suitable soluble silver salt is added to the persulphate solution before it is poured on the metallic silver. The practical importance of this fact will be referred to later. It was also found that the aqueous solutions of the persulphates alone gradually decompose when kept even at the ordinary temperature, oxygen being liberated while alkali sulphate and sulphuric acid remain in the liquid. The solutions of ammonium and potassium persulphate are neutral to litmus when freshly prepared without the aid of heat, but gradually become more and more acid on keeping.

In 1898 the use of alkali persulphates as reducers for photographic images was proposed by MM. Lumière, on the ground that they not only dissolve the silver image, but do so in a peculiar way, acting much more rapidly on the dense parts of the image than on the thin parts, so that the contrasts of the image are greatly reduced, with a consequent marked improvement in the printing quality of negatives which for any reason are "hard" or too strong in contrast. A reducer possessing such a valuable property as this naturally attracted much attention, but it is noteworthy that statements of different observers concerning its action are more or less contradictory, and the conditions necessary for successful working do not seem to have been fully grasped. It is not improbable also that the persulphates sold as "photographic" chemicals have varied considerably in quality. Be that as it may, so experienced a photographer and chemist as the editor of one of our leading photographic journals stated not long ago that he had practically given up the use of persulphates as reducers because of the uncertainty of the results.

It is singular that there has been a tendency to attribute practical failures to some inherent difficulty in the process, rather than to the probable presence of avoidable impurities in the persulphate or in the photographic film. The fact that a white precipitate may appear in the liquid while reduction is going on was quickly recognized, and one of the most experienced practical photographers now living regarded this (at one time at any rate) as a distinct advantage because it showed that the reaction was taking place (B. J. Almanac, 1904, p. 772), and more recently it has been proposed to base a "time" method of reduction on this phenomenon (R. B. Hughes, *Phot. Monthly*, 1909, p. 207). The appearance of this white precipitate certainly indicates that the reaction is proceeding, but also shows clearly that it is proceeding in the wrong way. If the reaction is going on properly, and producing only silver sulphate and alkali sulphate, as it ought to do, no precipitate should form at all. A clear gelatin film (exhibited by the lecturer) was originally an extremely dense overdeveloped negative, but the image was completely removed by ammonium persulphate without any precipitate or even cloudiness appearing in the liquid throughout the process. In fact, in the numerous experiments made in this series with the alkali persulphates, no trace of milkiness appeared except in one instance, when, through inadvertence, the tap water (which contains rather more chlorides than is usual) had not been washed out of the film. It is easy to prove that this milkiness or white precipitate consists of silver chloride or bromide, usually the former, and its formation is due to the presence of a soluble chloride or bromide in either the persulphate solution or in the film under treatment. The mischief is that if silver chloride or bromide is being formed in the liquid it may be taken as certain that it is also being formed in the film to a greater or less extent according to circumstances. It is possible, in fact, for the silver image to be largely converted into silver chloride if it is acted on by a solution which contains a chloride as well as the persulphate, because as soon as the silver is converted into sulphate it is at once precipitated as silver chloride, more or less completely according to the relative concentrations of the silver salt and the soluble chloride. In fact, a mixture of a persulphate and a chloride has been proposed as a bleaching agent.

[An exhibit showed this point clearly. A dense image, treated with persulphate containing a considerable proportion of chloride had been largely converted into silver chloride, as the color and general appearance showed. One end had been dipped in a fixing bath, which had removed a considerable part of the image, while the other end had been dipped in a developer which had reconverted the chloride into metallic silver.]

Experiments made with "strip" nega-

tives show conclusively:

(a) That the alkali persulphates markedly reduce the contrasts of a negative by dissolving the dense parts of the image at a far greater rate than the less dense parts, in agreement with previous statements, and that the flattening of the scale of gradations is more marked the longer the persulphate is allowed to act. In some of the specimens exhibited the higher densities, although distinctly different in the original negatives, had become not only much reduced but practically indistinguishable from one another. This is a necessary consequence of the fact that

(b) The rate of action of the persulphate increases with the mass of silver present; the higher densities are reduced more rapidly than the lower, until the whole image is reduced to one uniform

density.

(c) That the rate of action of the persulphates is increased by the presence

of free acid.

(d) That the rate of action of the persulphate is increased by the previous addition of a small quantity of a soluble silver salt, preferably the sulphate. Some workers add silver nitrate solution to the persulphate in order to accelerate the action, but this is undesirable, because with this salt a precipitate of silver peroxide is formed and an unnecessary complication is introduced. No such precipitate is formed with silver sulphate. As a matter of fact, except in very cold weather, a 5 per cent. solution of the persulphate acts as quickly as is When an accelerator is really necessary a few drops of dilute sulphuric acid is the best thing to use if silver sulphate is not at hand.

(e) That if the persulphate is made

alkaline by the addition of ammonia the reducing action is not stopped, but is made much slower, as Namias stated

(Eder's Jahrb., 1901, 166).

The exact mode of action of the persulphate on the silver deposit was made clear by the experiments of J. I. Pigg (British Journal of Photography Almanac, 1904, 894-99) and W. Scheffer (British Journal of Photography, 1906, 964). Pigg made photomicrographs of a half-tone screen negative (wet plate) before and after treatment with persulphate, and showed that whereas the ferricyanide and hypo reducer attacks the smaller grains and completely dissolves them before producing any marked effect on the larger granules in the middle of each "dot," the persulphate attacks the larger granules first and reduces all the granules to practically the same size before the smaller granules are dissolved or even appreciably reduced.

Scheffer made photomicrographs of sections of an exposed and developed film, and found that with hypo and ferricyanide the silver in the uppermost layer of the film is completely dissolved before the deeper parts of the deposit are attacked to any great extent-i. e., the deposit representing the shadows is removed, while much of the deposit forming the higher lights is left. With persulphate, on the other hand, action takes place uniformly throughout the deposit, and is conditioned mainly by the size of the silver granules. The persulphate solution penetrates the film rapidly, but acts on the silver somewhat The hypo and ferricyanide mixture penetrates the film slowly, but

acts on the silver rapidly.

Practice.—Ammonium or potassium persulphate can be obtained at a moderate price even at the present time, and of a very high degree of purity as regards freedom from haloid salts, if purchased from any of the principal dealers in fine chemicals. The ammonium persulphate is preferable to the potassium salt, because a solution of the latter stronger than 2 in 100 cannot be prepared at the ordinary temperatures. It is not advisable to use the ammonium salt stronger than 5 in 100, even in cold weather, and 2.5 in 100 is strong enough in warm

weather; or if the solution contains free acid, as it does after it has been prepared for a few days, the solution must be made with cold water, and it is most desirable that distilled water, or at any rate water free from chlorides, should be used for this purpose. The solutions decompose gradually, gaining free acid and losing persulphate, but if kept cool and out of strong light the rate of change is slow. The ammonium salt dissolves readily in water, and there is no need to make up a large volume of solution at one time.

The negatives or positives must be thoroughly fixed and washed; if they have been dried they should be soaked in water for at least three or four hours in order to avoid uneven action. They should be washed in three or four changes of distilled water to remove any soluble chlorides; the volume of water used for each washing need not be large, but each quantity should be allowed to act, with frequent rocking, for not less than five minutes (longer is better) and the draining between successive washings Distilled water. should be thorough. even in war time, is not expensive, and the cost of that required for washing a negative is far below the value of the negative to a professional photographer if it is worth his while to treat it with persulphate at all. The film must be free from finger marks and greasy patches. It is most important that the plate or film should not be handled with dirty fingers after it has been placed in the persulphate solution. Some form of lifter should be used if possible; if the fingers must be used they should be rinsed under the tap (and not wiped on a towel) immediately before touching The worst failures I have the plate. seen in the use of persulphate were due to handling the plates with fingers that were supposed to be clean, but were If the precautions specified are duly observed, the reduction with persulphate is, in my experience, a safe and certain operation, the principal risk being that the reduction may go too far. In ordinary work the presence of soluble chlorides is the principal source of error. If for any reason the absence of chlorides cannot be ensured, the process should

be carried out with a solution to which sufficient ammonia has been added to make it smell distinctly of that substance. The action will then be slow. but the character of the result will be the same and the risk of stains and irregularities much less. A few drops of ammonia may with advantage be added to the water used for the first two or three washings.

[Specimens were shown illustrating the effect of the persulphate on ordinary negatives. For instance, in the case of a whitewashed cottage with a grass lawn in front, considerable reduction can be

effected in the sky, and the walls of the cottage, without any recognizable effect on the grass. In the case of a waterfall in a glen, the density of the water can be markedly reduced with only a slight effect on the much thinner deposits that represent the surrounding rocks.

Persulphate can also be used with good effect in the case of lantern slides that are too opaque in the shadows. For this work it is not advisable to use a solution stronger than 2 parts in 100, or approximately 8 grains per oz. [Specimens of results were shown.]

(To be continued.)

FROM THE CAMERA TO THE SCREEN

How Motion-Picture Films are Developed, Printed, Titled, Tinted, DRIED AND POLISHED

By AUSTIN C. LESCARBOURA

GRAIN of dust, a slight variation in a chemical solution, an impure water supply, an otherwise insignificant fluctuation in the voltage of the current supply of the printing lamps, a trifling rise or fall in the temperature, an inconsiderable shrinkage of the film all these factors can mark the difference between a clean, clear and steady picture on the motion-picture screen, and a spotty, indistinct, and jumpy film unfit for use. Which means that once the film leaves the camera, the work of the actors, director and camera-man is entirely in the hands of the laboratory staff; and upon the experience, skill, and care of this staff depend the screen results.

Dust, The Motion Picture's Arch Enemy

At regular intervals the raw stock is received at the motion-picture laboratory in such quantities as always to ensure a fresh supply. Usually the film is unperforated when received, for the reason that, to insure accurate perforations, it is best to perforate it just before it is placed in the camera or in the printing

machine. Film perforated long in advance might shrink, and where accuracy is considered in terms of hundredths of an inch, this would not do. So the first step in the laboratory is to prepare the raw stock, either negative or positive, in

the perforating room.

To perforate the plain film great care must be exercised, for upon the accuracy of this work depends the steadiness of the picture on the screen. The machines perforate one set of holes at a time, after which the film is moved forward to the required distance to perforate another set, the operation being intermittent and not continuous. The perforators are operated with scrupulous care, and special attention is given to maintain rigid and uniform conditions of both humidity and temperature. Above all, the perforating room must be devoid of dust and dirt, for tiny specks on either negative or positive stock loom up big when magnified thousands of times on the screen; indeed, all film operations must be carried out in the form of a constant combat with the dust menace. Still another phase of perforating is to

condition the air properly, so that static electricity will not develop and spoil the film by permanently marking it with lightning-like streaks. Lastly, when the film is perforated it is given a farewell cleaning so that all dust accumulations and cuttings are removed. As can well be imagined this work is carried out in almost total darkness, such light as is permissible being supplied by ruby lamps.

The developing of motion-picture negatives is much the same as that of amateur films. The film is received in either the camera magazine or in a tin case, and upon being removed from the container it is wound on a wooden rack, emulsion side out. The rack is then placed in a narrow, vertical tank containing the developer and the developing process allowed to proceed. But while the amateur photographer has merely to place the contents of a packet into so much water, and then deposit his film in this solution for so many minutes, the motion-picture worker handling hundreds and thousands of feet of film, has to make sure that his solution is in constant motion. To this end it is the usual practice to keep the developing solutions in constant circulation, while to ensure perfect results the temperature is carefully maintained at a fixed standard.

The film racks are occasionally lifted from the developing tanks and brought in front of dim ruby lamps to ascertain the extent of the development, and it is such movement of the racks which prevents air bubbles and subsequent markings from appearing on the finished film.

Great care is required in preparing the developing solutions. Hundreds of gallons of developer are prepared daily in the larger laboratories and in each case a skilled chemist makes certain by analytical tests that it is of the proper composi-Formerly, these solutions were prepared by a sort of rule-o'-thumb; the workers placed a half-barrel of this constituent, three scoopfuls of that, and a pinch of a third into five barrels of water, and if their work did not turn out quite right, they unblushingly blamed it on some unknown condition. But today such procedure is no longer tolerated, for the industry has reached the highest standards. The developing solutions are

carefully watched and tested at intervals, and when the first signs of exhaustion appear they are replaced by fresh lots.

The Question of Pure Water and Plenty of It

When the film has been developed to the required degree, it must be washed to remove all traces of developer. For this purpose the film, still on the wooden rack, is placed in a large tub through which passes a constant stream of water. As in the case of the chemicals every drop of water must be filtered and known to be chemically pure before it is allowed to come in contact with the film. This means that a pure supply must be available in the first place, and that batteries of filters must be used to remove all particles of foreign matter.

Several years ago a film laboratory experienced considerable trouble in its work: films were never quite up to the required standard, although the same staff had turned out an excellent product when located in another part of the same city. Chemists were called in, and they immediately set to work analyzing the They found that the water supply. water, taken from a nearby river, contained considerable quantities of an undesirable substance, and advised the producer to that effect. Whereupon the producer had a special well sunk to a depth of over a thousand feet on his own property, in order to tap a virgin supply of water, which in this case turned out to be just the kind required.

Films, after they are thoroughly washed, are placed in tanks containing the fixing solution so as to remove the unaffected or free silver, making them transparent. Again they are placed in the washing tanks, this time for even a longer period to make sure that every trace of the fixing solution is eliminated.

Now the celluloid strips, still on the original racks, are sent to the drying room. Here they are taken off the racks and wound on huge wood or metal drums which are revolved at a fair speed. This drying operation is carried out in a room whose temperature is such as to insure absolute dryness; and the air, too, is carefully adjusted so as to aid this con-

dition. It goes without saying that the drying room is barred to dust of all kinds.

Time was when the film producer had to depend on the weather in drying his films; and on rainy days it was next to impossible for him to make any headway. He decided, at last, to sever all connections with the weather man: and today the work goes on whether it is wet or dry outdoors: the drying room is in reality a little world by itself where the dryness and the temperature are regulated by the mere twist of an electric controller. Thousands of feet of film can be dried at one time on a battery of drying drums, and this method prevents the film from developing troublesome bends or twists.

No matter how perfect the drying process may be, a negative always comes out of the drying room with numerous spots which are nothing more than the solid matter left after the water evaporates. To remove these spots the dried film is wound on a drum a few feet in diameter and covered with soft cheesecloth, and polished by girl operatives. Strangely enough, the best polishing material is the palm of the hand, and these girls rub their soft hands over thousands of feet of film in the course of the day's work. Of course, one must have absolutely dry hands to quality as film polisher.

Working Year after Year in Darkness

With the negative in its finished form, we are ready to make positive prints. As in the case of amateur photography, the negative film shows the image in reversed order, with the whites in black and the blacks in white, and a print is necessary to obtain the proper order of black and white. And just as in the case of prints on paper, it is possible to make any number of prints from the motion-picture negative.

Positive stock is not as sensitive to light as the negative stock, hence can be handled in a room provided with numerous ruby lamps, as compared to the almost total darkness of the perforating and the developing rooms. Still, to the

stranger the room is uncomfortably dark; and it is with marked surprise that he notes the ease with which the operatives carry on their work. It appears that these workers, toiling day in and day out in semi-darkness, develop their eyesight to a point where they can see almost as well in the dim red light as they can at twilight outdoors. At any rate, they appear to have no trouble in this direction.

The negative film is run through a printing machine face to face with fresh positive stock—the emulsion faces in contact. Each time a negative image comes into position in front of an aperture, a shutter allows a flash of light to pass through it and onto the positive stock in back, after which the two films are pulled down the space of one picture, bringing the next image into position. Thus the printing operation proceeds one picture at a time until the entire negative is run off.

If negatives were all of one density the printing of positives would be a simple matter. But negatives vary to a great extent, and almost every one requires a different printing time. So the first step in making a print is to determine the density of its negative. Some laboratories simply run off a foot or two on the printer with different adjustments of the light, and then develop the strip so as to note the tones and select the proper one. Other laboratories have a set of negative strips of varying intensities arranged in front of a lamp, and simply compare the negative with the standard samples to obtain the printing factor. In either case the density of the negative is obtained and marked on the negative; in this manner the girl operatives know how to adjust the intensity of the light or the speed of the printer when the roll comes to them.

Anyone who has made prints on fast gaslight papers realizes how important are the light intensity and the printing time in this kind of work. And he can therefore appreciate how careful the motion-picture workers must be to maintain a constant and known intensity of light in their printers, and a flawless mechanism. In the more up-to-date laboratories each lamp is tested daily

with a photometer to ensure standard

and uniform intensity.

Positive film is developed, fixed, and washed much after the manner of the negative film, after which it is dried and polished in the ways already described. But there are occasions where certain strips are to be tinted or toned, in which case special treatment is required before

the final operations.

A vast difference exists between tinting and toning. Tinting has to do with making the celluloid stock of the positive film take on any desired color, so that the entire picture appears of that one color and black. Toning, on the other hand, has to do with converting the blacks into any desired color, but leaves the celluloid stock untouched or colorless. By combining the tinting and toning operations many beautiful effects can be obtained, such as tinting the film a light buff and toning it a dark blue. Tinting is mostly carried on with dyes, while toning requires mineral salts chemicals which in some colors are now very scarce. The treatment in either case consists in dipping the film, as it comes from the washing tanks, into the vats of coloring matter, and removing it only after the desired shade is attained. after which it is given a final washing.

How Motion-Picture Titles Are Made

Again with title, diversity of methods available is not lacking. Some laboratories prefer to print the copy for titles on plain pieces of paper, in bright red ink, thus obtaining a negative. Others print the titles in white on a black background, thus obtaining a direct positive effect. In either case the services of a printer-compositor are required, and also a skilled pressman who can pull clean proofs on a small job press. A method which has passed out of favor of late is to lay out the titles with movable orna-

mental borders and letters on a background of black plush, permitting rapid

changes.

The titles are photographed with a motion-picture camera in the same manner as would be the case with a scene, and the resulting negative or positive is available for any number of

prints or in any quantity.

By this time small rolls of positive film containing up to 200 feet of film make their way to the assembling room, where they are ready to be examined and cut and assembled into finished productions. Although it is not generally known to the public, we never see but the abridged film of any given production; that is to say, the average fivereeler is actually made up from ten thousand or more feet of film, trimmed down to size. For it is a physical impossibility for the producer to make a production of five thousand feet with only five thousand feet of film. Many scenes have to be retaken and many are found unnecessary to the story when examined on the screen.

Editing a film is perhaps the most interesting phase of laboratory work. The editor, usually the director himself in dramatic productions, directs the cutting and assembling of the various strips of film into the complete production; and just as the editor of a magazine reads the printer's proofs and makes his corrections, so does the film editor view the assembled film on the screen and make corrections and changes. Finally, when the film is approved of, it is used as a standard for the assembly of duplicate films by skilled girl assemblers.

Packed in round cans, the film reels find their way to the exchanges throughout the world, and from the exchanges they make their way to the projectors in thousands of picture theaters, there to entertain the millions of devotees of the motion-picture screen.—Scientific

American.

THE PITTSBURG SALON, 1918

By W. H. PORTERFIELD

THE fifth Pittsburg Salon, as an event, has passed into history. It was not without its days of deep concern, for it would be but natural and really expected that this year might see fewer prints and perhaps inferior in quality to those that made up the salons of former years. It was therefore in somewhat of a pessimistic frame of mind that the committee began to unpack the parcels that had accumulated up to the closing day.

Among the first to receive attention was the contribution of Dr. A. D. Chaffee, of New York. This package contained a number of most remarkable prints, out of which a full representation was selected, every one of which defies criticism and approaches perfection to such a degree that only fundamental tastes make it possible to express preferences. No. 43, "Vitre-Ille et Vilaine," and No. 45, "Off Brixham, Devon," are surely masterpieces of the photographer's art.

Likewise did the succeeding parcels continue to furnish material of the most encouraging quality, and out of the 900 prints submitted no less than 330 were selected by the judges as worthy of a place on the exhibition walls.

Instead of a collection of prints which were expected to offer a silent excuse for their makers' inability to do their "regular stuff," owing to the exigencies of the times, it seemed that every worker labored with the idea in mind that there would be a shortage of good things, and it was therefore "up to him" to exert more than the usual effort in order to overcome this condition.

While the unprecedented number of prints received was a most welcome surprise to the committee, the space at our disposal is such that only a few, comparatively speaking, can be mentioned in this review. To the many whose names do not appear we ask their kind indulgence, assuring all that their pictures afforded pleasure to thousands of appreciative people, and through their generous support the Salon

reached a standard never before attained by any photographic exhibition held in this country.

It is a patriotic duty and a great pleasure to mention the names of Messrs. Karl Struss, J. N. Giridlian and James N. Doolittle, Salon members who are in the service of our country, and although the former are not represented in this year's Salon, their work of other years is still remembered. The third member, Mr. Doolittle, was able, however, to send five admirable prints, of which "Celestial Light," a japanesque figure study, stands preëminent.

As in the past two years, California looms large in the present Salon. Some of the strongest work in the show comes from John Paul Edwards, of Sacramento, and William H. Rabe, of San Francisco, both of whom are represented by six prints each.

Rabe's "Study for a Theatre Curtain," No. 232, and "Lure of the Woods" are characteristic and above criticism.

Edwards has one of the finest landscapes in the show in No. 80, "Pines of El Merced."

Other Californians to score distinct successes were Louis Fleckenstein, with his strong Indian study, "Dawasonta," Fred. K. Archer, who sends six prints that are well-nigh faultless; Louis A. Goetz, in his presentation of poetical figure studies, and Anson Herrick, who shows wonderful beauty in his simple landscape study, "Solitude."

Arthur F. Kales, of Los Angeles, sends a collection of prints composed of landscape and figure studies that maintains the excellent reputation this worker won at last year's Salon. "The Sorceress" and "The Daughter of the Sheik," though diametrically opposite in conception, are equally striking in effect.

"Tom," a portrait of a boy, by Otto C. Schulte, of San Francisco, is worthy of the highest praise.

One wonders at the versatility of Edward Henry Weston, of Tropico, Cal. Always interesting and a master

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of technic, his collection of prints is a show in itself. "The Fan," No. 308, and "Vaudeville," No. 309, are the most admired of his six prints at the exhibition.

As in former years, Charles K. Archer, of Pittsburg, has the most characteristic picture of the Smoky City mill district, while his "Evening" and "Crooked Road" are good examples of composition.

The gum process seems not to be as popular as in past Salons, though George Alexander, of Chicago, presents four excellent prints in that medium, of which the "Moss-covered Branch" and "The Alarm" are, if anything, even better than his work of former years.

C. E. Beeson, of Pittsburg, advances well to the front in "A Sunlit Pergola" and "A Court of Honor," both remark-

able prints.

The six prints shown by C. W. Christiansen, of Chicago, depart radically from his past style of work, yet they are no less interesting; "The Gull" and "A Study of Pond Lilies" being particularly good.

G. Buell and Hebe Hollister, of Corning, N. Y., show an old-world street scene of exceeding beauty, entitled "Cathedral Spires," and a landscape with figure that is full of atmos-

phere and well-rendered tones.

In Portland, Maine, the Salon has two exceptionally strong workers in the persons of Francis O. Libby and Dr. Rupert S. Lovejov, each represented by six prints; both treat of the poetical in landscape in a decidedly individual manner, and, as remarked last year, Libby has developed a broad and pleasing style that is quite apart from anything else on the walls. No. 168, "Beyond," a study of big trees, and No. 171, "The Moon Maiden," are among the best. Dr. Lovejoy reaches his highest mark in "A Summer Symphony" and "Idyl of Spring," two beautiful warm outdoor figure and landscape pieces done in a duotone process that is particularly adapted to his style of work.

Six prints by Mrs. William H. Rau, of Philadelphia, are varied in subject, but all of most interesting character

and quality, "Luncheon Time," "Curiand "The Homecoming" being especially good in illustrative values. O. C. Reiter, of Pittsburg, has a

well-balanced. luminous landscape

entitled "Eventide."

"Early Morning," a picture of canal boats awaiting cargo, is the work of David W. Bonnar, of Buffalo, and the most interesting of his three fine marines.

Of the many outdoor portraits at the show, none carry better quality than the print entitled "In the Garden," by J. C. Carlton, of Los Angeles.

Fannie Tuttle Cassidy sends two prints. "Morning Light," while a trifle heavy in color is a good landscape, and "Repent at Leasure," showing a singed moth at the base of a candle-holder, is most expressive.

Ouite the most dramatic and striking picture in the exhibition is Francis W. Cowell's "Storm," in which a nude study of a man bends to the force of the

elements.

Forman Hanna's "Apaché Belle" is a fine cháracter study of an Indian head.

Suisoi Itow, of Portland, Ore., makes his first appearance at the Salon with three more than ordinarily good prints. This is particularly true of No. 140, "A Little House Across the Hill." principal feature of the picture is the attractive manner in which a line of small shade trees is used to form one of the main lines of composition. The "Sunset Pool" and "Hillside Path" are landscapes of pleasing quality.

"An Old Colonial Meeting House,"
"The Old State House," and "Northam Towers—Trinity," are a trio of prints by William H. Thompson, of Hartford, Conn., that are decidedly impressive, though the obviously "worked-in" skies, while beautifully done, are so conspicuous that one's attention is immediately drawn to that, leaving the principal objects of the picture to take second place.

Edward Everitt Taylor's "A Venetian Study," showing an unfamiliar view of old houses and a canal in Venice, is fully up to this artist's previous Salon exhibits.

"Circe's Palace," by William S. Richter, of Philadelphia, shows Circe the sorceress, daughter of Helios, surrounded by the magnificence which is



PITTSBURG SALON, 1918
"A MODEL"
BY JOHN C. BURKHART
WASHINGTON, D. C.



supposed to have existed in this palace according to the mythology of the Greeks. The composition is beautiful in the extreme, as are also the effects which Richter shows in "Vanity," "Still Life," and "Pan."

The better of Albert F. Snyder's four prints is "Approaching Storm," a large dark blue carbon which satisfactorily carries the effect referred to in the title.

Alice Boughton, of New York, is excellent in all three of her pictures, but especially so in the delicate figure study, "Pierrot;" "The White Ruff" and "By the Sea" follow closely.

Though moderate in size, the six prints by H. Remich Neeson, of Baltimore, are big in pictorial value, "Charles Street, North" possessing much the same charm as his "Cathedral Street"

in last year's Salon.

Claude L. Moore, of Buffalo, adds considerably to his reputation as a pictorialist with an unique marine entitled "The Eyes of the Harbor," in which a great cloud of smoke from a passing tugboat and two aëroplanes in the

sky are the striking features.

Other marine pictures worthy of note are "Gloucester Harbor," a typical fishing town scene, by E. I. McPhail, of Buffalo; "East River Mists" by by Maxwell Lawton, of Brooklyn; a print of the same title though different in effect by M. A. Bessey, also of Brooklyn, and "The Harbor Evening," by Charles L. Peck, of Buffalo, the latter unquestionably one of the most effective pieces of the show.

Herbert H. Piper creates some exceedingly interesting designs in his two boat pictures entitled, "Curves" and "Home from the Catch." Both pictures, evidently made from an elevated position, show neither sky nor distance, the outlines of the boat's cabins and gunwales furnishing the lines of composition.

"A Decorative Panel," in which three figures are posed with the skill of a master mural painter, is the single entry of Hugh Thomas, of Buffalo.

Jane Reece, of Dayton, O., has in "An Old Print," the quality often found

in ancient drawings.

"Park Row—Early Morning," and a picture of "New York from the River," supplemented by two Connecticut landscapes, constitute the exhibition of Dr. D. J. Ruzicka, of New York.

A window portrait, entitled "Study for a Magazine Cover," similar in general lines to her last year's successful print, and a very creditable picture of a "Cellar Doorway," come from Mrs. Mary W. Wiltse, of Wawa, Pa.

N. S. Woolridge, of Pittsburg, makes a strong picture of the statue of "Shakespeare" at the entrance of the Carnegie

Institute.

Of the many figure studies in the Salon none are more satisfactory in pictorial quality than Percy Weymann's "Ho! Charon" and "A Breath of Summer."

Hervey W. Minns, of Akron, O., is always pleasing in his child studies, and this year's contribution, "Peek-a-Boo" and "Sweet Sympathy," are characteristic of his style.

"Winifred the Lute Player" is the most popular of Mrs. Doris U. Jaeger's

four creditable prints.

"The Little Street" and "The Entrance," by Charles H. Jaeger, of New York, are very worthy prints which could be made still more effective

by enlargement.

A soldier on board ship waving, "Goodbye to New York," with the tall buildings of the Metropolis seen in the distance, and "An Enemy Act," showing a huge structure enveloped in smoke and flames, are two dramatic prints by William H. Zerbe, of Richmond Hill, N. Y.



PITTSBURG SALON, 1918
"PORTRAIT OF MRS. C. B. F."
BY G. W. HARTING
NEW YORK CITY





PITTSBURG SALON, 1918
"THE NEW BOAT"
BY DORIS U. JAEGER
NEW YORK CITY





PITTSBURG SALON, 1918
"THE STROLLERS"
BY JOHN PAUL EDWARDS
SACRAMENTO, CAL.





PITTSBURG SALON, 1918
"IN THE GARDEN"
BY J. C. CARLTON
LOS ANGELES, CAL.





PITTSBURG SALON, 1913
"BETTY"
BY LOUIS FLECKENSTEIN
LCS ANGELES, CAL.





PITTSBURG SALON, 1918
"THE HARBOR—EVENING"
BY CHARLES L. PECK
BUFFALO, N. Y.



PRESS PHOTOGRAPHY FOR THE COUNTRY PROFESSIONAL

By J. PEAT MILLAR

the present time, when the effect of this great wave of cheap photography is being felt in the most remote country studios, it is necessary, if things are to be kept moving in a respectable manner, that nothing should be let slip through the fingers which is the least likely to bring "grist to the And doing a little press photography now and again as occasion permits is one of the ways in which the country professional can add considerably to his income if he only cares to put himself to the trouble. The demand for photographs of typical incidents is becoming greater every day, and those who are alive to their own interest will take care that they at least supply some of that demand.

It is a very poor policy to sit down and say, "Oh! this is work for a specialist, and a little out of my line." one today can afford to take up that stand: it was all very well when sitters were plenty and prices good: a man could shut himself up in his studio then and live. No one is more able to take a good negative and turn out a first-class print suitable for reproduction than the man who has given his life to the business, and that, accompanied by promptness of dispatch, is really the only expert work there is about the matter, unless one goes in for some high-speed work in dull weather: but this is really a branch by itself, and has not the same general market value as many other easier subjects.

Many will tell you that there is nothing about their place to take suitable for sending to the press. But this is a mistake, as every town, and even village, has repeated functions where interesting snapshots of unusual events, notable people, etc., can be had in plenty. The review of the local troops by some officer of note, the opening of the bazaar by some lord or lady, the unveiling of any memorial to some person of note, laying of foundation-stones, and many other

subjects to be found in every town are all of sufficient interest to be reproduced in *some* of the daily papers, and also weeklies. Portraits of local people who have in any way become distinguished, even although it should be by having lived longer than anyone else, will also generally find acceptance. The various sports and pastimes, such as cricket, golf, hockey, and all athletic games, can be made to supply material, especially when there happens to be any of the well-known champions present.

Even the local cattle show, and also the horse market, can be forced to supply prints which will find favor with the editors whose papers cater for the farmer and horse dealer. Incidents of note in the hunting field, especially if they contain portraits of notable people, will always find a ready sale. In fact, there is no limit to the number of occasions where the live photographer can exercise his craft to his own benefit if he only cares to try.

At the same time it is possible for a photographer to attend any function, expose a number of plates, and find later that not one of them was acceptable by an editor. It is no use taking a large camera and exposing plates on a crowd of people with the principal characters appearing as midgets in the center.

What you want is to get the principals large on the plate. No matter if there is a crowd behind, get the principals large and sharp. And this is work where a hand camera excels. Never pose the people. Posed pictures are seldom acceptable. Watch what they are doing, and snap at the right moment. Keep the human interest well in mind. Grasp at every opportunity; chances are rare. Never hesitate; rather lose a plate than miss a good thing.

Get to know beforehand who the principals are, so that you will know them by sight: it may save a lot of plates and disappointment. Very little often

turns the balance of interest. A tilted lady and gentlemen were presenting veterans with medals. There was a long list (over a hundred) to receive their medals. One plate was sufficient to illustrate the fact. A number of photographers (all press men) exposed their plates on the first one or two who received their medals from the hands of the lady. The local photographer cast his eye down the line of waiting veterans, and spotted a well-known magistrate and editor of a local paper among the veterans waiting their turn. This was his chance, and he took it when the time came. None of the rest knew the man nor his local importance. This snap was reproduced many times over.

After plates have been exposed for press purposes on any important event, the next thing to do is to get them into the editor's hands without delay. There are two ways of doing this. You can either risk all your eggs in one basket and send or take the undeveloped plates to one editor; or you can develop the plates, make suitable prints, and send copies to various editors. And there is a third way: You can send your plates to an agency, and they will do all the rest.

What is best to do depends a good deal on circumstances. The first is the quickest way, and the last is the slowest, and really the worst unless you are the only photographer who was there, and it must be remembered that the plums go to the man who gets there first. And there are such things as "scoops' in pictorial news as well as the other kind, as the following will serve to show: Early one spring morning the town was startled with the cry that there was a railway smash at the local station and much damage done. The early morning train, having dashed through the terminus, was found derailed in the town street. By this time the local photographer was busy taking snapshots all around the wrecked train, and also of the houses it had dashed into. Two dozen plates in all were exposed before word was sent round that a special train was ready to take the belated passengers to the city. The local photographer realized that by another hour or so a number of press men would be down with their cameras for a harvest, and would return to the city by the afternoon train with their spoils; but he must get there first, so he took a ticket and went in the special to the city, made straight for an editor's den and offered him photographs of the railway smash almost as soon as he had heard of the accident. Needless to say, they were eagerly snapped up, and the photographer received more for his morning's work than he had ever made in the studio in any week.

Such chances may be said to be rare, but things of a similar nature are always happening somewhere, and the local photographer should always be ready to grasp the opportunity when it

comes.

Even when events are known in advance, the press men can be beaten at their own game. A certain carnival of athletic games is held every year. Press men come from the city to take snaps of the most important events. takes up the whole day, and the press men are late in getting home; vet they have to go to the office and develop their plates and make prints for the block makers to start at in the morning for that or next day's paper. The local photographer keeps a boy running to and from the field to the studio, unloading and loading dark-slides, packing exposed plates, and sending them to the city by the first passenger train, with the result that he gets some pictures of the earlier events in the papers on the day in which they take place, and again reaps the benefit of being there first.

There cannot be too much importance attached to the getting of your work before the editors at the earliest, and it is by knowing and taking advantage of local conditions that the home man can hope to beat the expert at his own game. And in the event of not being able to be in advance it is best to send your work to a paper which has not a man on the spot. Arrangements can generally be made for a paper to expect to receive prints from you, and in that case probably they will not send down anyone

from the office.

When it is preferred to keep the

negatives at home, they should be developed at once and dried as quickly as possible with spirit, the best selected, and a number of good enlargements about 8 x 6 made on glossy bromide paper of good quality. It is not alway necessary to enlarge all the negative, but just that part which contains the vital human interest. Those enlargements should be washed, fixed, and dried (with spirit) as quickly as possible. Plain, terse details and description of incident, with principals' names, should be clearly written with a soft pencil on the back of each, with photographer's name and address at the corner. They should then be despatched by first passenger train to their various papers, and, if of sufficient importance, a wire should be sent advising the editors of the fact of them being sent, also the train time given. Now although all this hurry is recommended it must be understood that the work must be good to have the best chance. You must make a good negative of great printing strength, and the enlargements must be also good sharp, clear, and brilliant, pure white and deep, strong blacks almost to hardness, but fully exposed. Remember that they have to be printed on rapid machines from open grain blocks, and that good, clean prints stand a much better chance of acceptance than anything dirty or flat.

The best camera for this class of work is one that can be easily handled and plates changed quickly. A focal-plane shutter, although handy, is really not necessary unless for high-speed work. More importance should be attached to the lens, which should be of the very best, of fairly long focus, and working at a very large aperture, f/4.5 if possible, and not less than f/6, to suit all conditions of weather, although much can and has been done with ordinary R.R. lenses at f/8. The very fastest plates should always be carried. Nothing can be fast enough for the press photographer, for time exposures can never be given, and the subjects are always near the camera, and generally heavy and dark, being very often in enclosed places where the light is never at the best. Therefore use your fastest lens, and buy the most rapid plates to be had. Don't be discouraged by getting a few of your attempts returned with thanks. If you send the right material you will get it accepted and well paid for. And look at the advertisement you get when you have anything or anybody of local interest reproduced in one of the papers! Everybody in the place talks about it.— British Journal of Photography.

ALWAYS rinse the plate between development and fixing.

ALWAYS rock the developing dish if

pyro is the developer.

OXIDIZED developer acts strongly as

a retarder of development.

ALL sulphites owe their preserving properties to the sulphurous acid they contain.

THE "personal equation" is an important factor in successful negative development.

If a one-solution developer is being made, the alkaline portion must be added last of all.

In warm weather a developer containing metol is liable to fog plates unless kept below 65° F.

Hydroquinone alone gives "pretty" negatives, rather than negatives of good printing quality.

To stop development without fixing, place the plate direct into citric acid, 5 grains; water, 1 ounce.

THE developing power of hydroquinone falls off more rapidly in cold weather than any other developer.

In making up metol solutions the metol must first be dissolved in water and the sulphite added afterward.

STEREOGRAPHS WITH THE ORDINARY HAND-CAMERA

By W. W. TODD.

N a recent number of one of the leading photographic magazines there is a short but much-to-the-point article by Harold Loeb, in which he laments the decline of stereoscopic photography among amateurs, and calls attention to the difficulties to be met in obtaining stereo supplies, and, particularly, good stereo cameras at reasonable prices. latter item is one that is indeed sufficient to curb the ambitions of many an amateur who would fain follow this most fascinating branch of the photographic art, for any but the most affluent artist must naturally hesitate when it comes to a matter of expending anywhere from thirty to sixty dollars or more for a good stereoscopic instrument; and yet any camera owner who has ever viewed any of his pet scenes through the magic prisms of the "scope" knows just how strong and frequent is the desire to secure some prized bit of landscape or home view in stereoscopic form. There is a peculiar appeal and personal interest in stereo views of friends and familiar scenes which is not approached by any other branch of the photographic art, due of course to the very life-life perspective imparted by the stereoscope.

The loan of a stereo camera for a few weeks, by a friend, quickly converted the writer to the thin but faithful ranks of stereo lovers. Shortly after the camera had been returned to its owner the writer chanced upon some bits of scenery that he particularly desired to record in stereoscopic form, but the necessary instrument was not then available. Being, of course, familiar with the basic principle of stereo-photography, which demands two separate negatives of each subject, the negatives being made simultaneously by lenses set about three to three-and-a-half inches apart, the idea naturally suggested itself of adopting the simple expedient of making, with the postcard-size camera then at hand, two separate negatives of the view, the camera being moved the necessary dis-

tance to one side for the second exposure. A bit of smooth, even board, about seven inches wide by eleven inches long, was procured; a guide-strip of thin wood nailed to one of the lengthwise edges of the board, so that it would project about a half inch above the top surface; a gimlet-hole of the proper size to accommodate the tripod screw bored in the center on the under side, which admitted of the board being screwed firmly to the tripod top. The camera was then placed in the vertical position on the board, near the left-hand end, with the back of the instrument set squarely against the guide strip. Using the right hand edge of the camera as a straight edge, a pencil line was drawn at right angles across the board, and three and a half inches to the right another similar line as a guide for the distance the camera was to be moved. It was then a matter of but a few moments to make the first exposure, wind off the film, slide the camera along the board till the edge of the bed came even with the second pencil line, and make the second exposure. A surprisingly good stereo picture was the

Since then the writer has learned that there is a little contrivance on the market for the purpose of shifting the camera the proper distance for the second exposure, but he has found the above described homemade affair sufficient for all needs and has made a number of excellent stereographs by this means, by which, despite the very apparent limitations of the process, quite a number of interesting stereoscopics of varied subjects may be added to one's collection. important points which, no matter how great the hurry of taking the picture, must be carefully observed, are: (1) the camera must be on an absolutely level surface; (2) it must not be twisted out of line when moved for the second exposure, and (3) one must be sure to wind off the first exposure before making the second.

No originality is claimed for the idea,

which is one that would occur to any photographer cognizant of the foundation principles of stereoscopic work, but there are many amateurs to whom the idea will, no doubt, be new, and to these it is offered for what it is worth.

As before stated there are decided limitations in the process which are not imposed upon the manipulator of a regular stereoscopic instrument. Moving objects are of course out of the question, and it is not safe to attempt to use as subjects young children or animals which are almost sure to move before the second exposure can be made. In landscapes, too, the worker must choose a quiet day, as any considerable movement of the foliage or branches of trees will destroy the perfect "register" of the picture. A slight movement of leaves and branches, however, provided it is not in the immediate foreground, will not seriously interfere with the stereoscopic effect. In views which include water showing reflections it is, of course, necessary to select a time when the surface of the water is comparatively quiet.

So much for the subjects that must be avoided. As for those which are within range of this method, the writer will mention some of the subjects in his collection taken by this means: Summer and fall landscapes, with and without posed figures; snow scenes (exceedingly effective as stereoscopics); river views; interiors, with and without figures; family groups, where the subjects could be depended upon to keep still for not less than ten seconds; fruit and flower subjects (also very effective in the 'scope); figure studies, posed by a reliable model, and, last but not least, an orchard scene including fruit pickers and a team of, fortunately, very lazy, sleepy mules!

The sizes of cameras best adapted for this purpose are the $2\frac{1}{4} \times 3\frac{1}{4}$, $2\frac{1}{2} \times 4\frac{1}{4}$, $3\frac{1}{4} \times 4\frac{1}{4}$, $3\frac{1}{2} \times 3\frac{1}{2}$ and $3\frac{1}{4} \times 5\frac{1}{2}$, all popular sizes, one of which is almost sure to be in the possession of every amateur. The pictures should be made in the vertical position of the camera, except in the first-mentioned size which may, if desired, be used in the horizontal position. In the case of the $3\frac{1}{4} \times 5\frac{1}{2}$, or "postcard" size, about an inch or more will have to

be trimmed from the top of the prints, as the vision of the stereoscope is not of sufficient angle to include so tall a print.

As to making the prints, transposing frames, while a convenience, are not a necessity. If one has not a printing-frame large enough to accommodate both negatives at once, let him use two frames, side by side, at the same distance

from the light.

For the benefit of those who have never made any stereo prints it is well to call attention to the fact that the prints must be transposed in mounting, i. e., the print made from the left hand negative must be placed on the right end of the mount, and vice versa. If wrongly placed the finished picture will fail to give the relief or perspective which is the life of the stereograph. In case the negatives have not been cut apart, pencil-marks "R" and "L" on the respective prints is all that is needed In the event of negatives being cut apart, or of prints getting mixed, a simple and sure way to tell "which is which" is to place a mount in the pictureholder on the 'scope, and, holding the two prints against the card, look at them through the instrument. If they are not properly placed there will not appear any perspective, in which case the positions of the prints must be reversed. In the trimming-down of prints to the proper size, care must be taken that exactly the same amount of the bicture portion is cut from each print, whether trimmed from bottom, top or sides, remembering that the same objects in the two prints must be on exactly the same level or base-line. However, the righthand print will show a little more of the view to the right, and the left print slightly more of the objects to the left, due to the difference in the position of the lens in making the respective nega-

In the composition of the view one will soon note the remarkable degree in which the stereo effect of the picture is enhanced by the judicious employment of various objects in the different planes of distance. A bit of shrubbery in the foreground of a large lawn, a receding line of trees, an archway of branches through which a house or bit of landscape is seen, or even a few scattered bunches of sedge grass in a field, will all give a wonderful effect of perspective.

In offering these suggestions the writer does not pretend to say that the aboveoutlined method will take the place of even a moderately good stereoscopic camera, for, like all makeshifts, it has its crudities and drawbacks. He does claim, however, that the enthusiastic amateur who does not object to taking a little care and time may by this simple means become the posessor of a very creditable collection of really good stereographs, and the fact that they can be made when finances or condition would preclude the use of a regular instrument for the purpose, will not, in any manner detract from their charm.

METHODS AND FORMULAE

Photographing Flowers. Flowers may be beautifully arranged and photographed on a plate of glass supported horizontally about a foot above a suitable background—a maroon or olive table-cloth for example; the camera supported on a framework in a vertical position, of course. Another satisfactory way is to interlace or fasten them to wire-gauze stretched on a frame—an ordinary window-screen will do—with a suitable background behind. For really excellent work of this kind orthochromatic plates and color-filters are necessary.

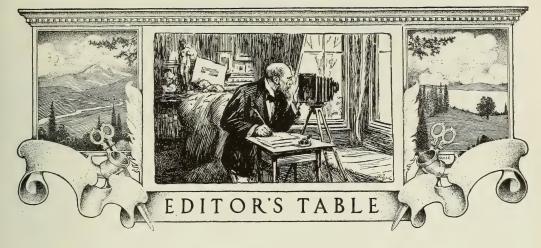
Stains on Developing Papers. Stains on bromide and other gaslight papers can be avoided altogether by taking the following precautions: (1) The developer should not be used beyond the point at which it becomes cloudy; (2) old solution should not be revivified with new; (3) each print should be rinsed for an instant before consigning it to the fixing bath, and a quarter of an ounce of sodium sulphite should be added to each pint of the fixer; and, most important of all, (4) the hypo should not be used for two days in succession. The prints, too, should be kept on the move in the fixing solution, and no opportunity given for large air-bubbles to collect.

Sensitizer for Postcards, etc. Distilled water, 10 parts; silver nitrate, 3 parts; uranium nitrate, 30 parts; and absolute The material, alcohol to 100 parts. whatever it may be, requires no previous preparation beyond sizing. The solution must be brushed on, and allowed to dry in the dark—which does not take long. When printed it needs no toning, but is fixed in two or three baths of water acidulated with nitric acid, and washed. When warm tones are desired, the material is dried in front of the fire, or ironed on the wrong side with a hot iron. Very good results may be obtained with this on silk, pocket handkerchiefs, postcards, and other things besides. The solution must be kept in a bottle covered with opaque paper, or else in the dark.

Pyro-acetone Developer for tray development:

				∠ x			
Water.							16 oz.
Oxalic aci	d						12 gr.
Pyro							1 oz.
Water Cramer's Cramer's	dr	y st tuid	ılpl	iite	sod ie	а	20 oz. 2 oz. 4 oz.

For use take one ounce of A, two ounces of B and twelve ounces of water.



LIGHTING

O say that lighting is of paramount importance in the studio is to repeat what the youngest photographer knows; but the importance of lighting in work outside the studio is not equally well grasped. Lighting is supposed to be a good thing, but many outdoor workers do not sufficiently realize that it is an essential thing. It is more than this, it is the essential thing, and subservient to it are the other qualities of the picture, composition, atmosphere, technic. Lighting is more important than definition. The man who makes microscopic detail the first consideration is but the grown-up edition of a child. Equally so, by the way, the man who blindly follows diffusion of focus as an end in itself. The set made by so many artists against photography is not altogether either ignorance or jealousy, but rather a recognition of the fact that photographers ignore breadth and lighting, and an erroneous impression that this is the fault of the process rather than of the man.

We have been so accustomed to hear splendid definition and microscopic sharpness lauded above every other quality in a photograph, that unless the picture will bear examination with a magnifier it is set down as inferior, and we are astonished when a less sharp but better lighted picture is preferred.

"The most simple and homely subject," it has been said, "well lighted and

treated with artistic judgment, appeals to our instincts in quite a different manner and much more pleasantly than when absolute sharpness throughout has been the chief and almost only consideration. Let us, as an experiment, take the trouble to carefully consider the same grouping or view under different conditions of lighting; it will be found that not only infinitely superior effects are produced at one time than another, but that the actual composition is altered; each variation of the light will bring some object into prominence that was previously hidden, and obscure others that were before the chief points in the subject. Let us suppose we are looking at a woody glade with the shadows of the trees thrown across the path, some cattle in the foreground, whose warmth of coloring contrasts well with the cooler tints of the foliage and distance. The camera is fixed and the exposure made; and we consider we have secured a gem. We stay and watch the scene: As we look a change gradually comes. Branches and leaves we had scarcely noticed catch the light; shadows are cast from this object and the other that we were scarcely conscious of existing; a tuft of grass or a group of foliage becomes an important point, giving a life and vigor to the subject that when we exposed our plate was simply non-existent. we had only waited, how much better it would have been! We have secured a picture, it is true, but nothing in comparison with what we are now looking at;

but regrets are useless, we can do nothing more than watch the lights change and the shadows alter. The view is passing through a series of transformations, some better, some worse, all different, and to our chagrin many of the changes are a considerable improvement on the one we thought at first so excellent; we move away, much less satisfied with our performance than when we closed our camera and sat down in the shade to rest. This is not a rare experience, so far as the view goes, but one that is of frequent occurrence, and emphasizes the necessity of a knowledge of lighting that would have indicated the advantage of waiting a little time before making the exposure, and have assisted us in securing a much better picture than the one we did."

Too often the photographer is in too great a hurry to get a picture. What a pity that each shot brings some result, and that the value of the result cannot be more accurately gauged. The sportsman with a rifle knows that it is hit or miss, he brings down his game or else it escapes, and if he wants to empty all his cartridges he does so to his cost. If we were limited as is the sportsman we would make fewer pictures, but with better results.

Closely associated with lighting is expression, for expression is found in all things, animate and inanimate. A tree or a plant may assume a graceful or ungraceful position, may interfere with the picture, or assist in making it; or expression may depend on the state of the atmosphere, or the grouping and general arrangement of the subject. We believe it was Sir Thomas Lawrence who said "a knowledge of beauty is essential to truth;" therefore, if we wish to produce landscape photographs we must not neglect to put our knowledge of beauty into a form that others can appreciate by selecting times and seasons when the power of conveying truthful impressions is most readily available. Atmosphere is a potent factor in giving expression to the picture; without it everything is apparently on the same plane. A distant object is dark as a near one, and the linear perspective fails to give the idea of distance. Generally speaking, a light should be chosen that will give as much value as possible to the different planes of the picture, so that each object sets out distinctly from that behind it. This is especially required in open and extensive views, which, if improperly lighted, will be represented by foreground and a flat distance and middle distance, almost indistinguishable one from the other. Perhaps the most effective style of lighting is when the source of light is directly in front, but is only suitable for special effects and special subjects; even then the lens must be protected from the source of light, or the attempt will result in fog and failure.

If it is cleverly handled, it sometimes gives effective results. The safest light is from the side of, and a little behind, the camera. It may not always give good results, but it is not likely to give glaringly bad ones. But though the safest, the able worker will not limit himself to it, for the worker is always the dominant

factor.

A PHOTOGRAPHIC HISTORY OF THE WAR

IN a compilation of the pictorial history of the war, it is the desire of the War Plans Division of the General Staff of the War Department to secure for the official files of the Army War College, a comprehensive series of photographs that illustrate the war activities of your city. The coöperation of our readers is requested in the collection of such photographs as in each judgment should properly be included as a part of a permanent historical record of the part which your city has taken and is taking in this crisis.

Among the photographs that may be included in this record, are those that show the departure of local troops to the training camps or to the points of embarkation, the activities of the local war relief societies, including the Red Cross and the Food Administration, the arrests of enemy aliens and suspects, destruction of property attributable to enemy activities, sales campaigns for government bonds and war stamps, visits of foreign officials, military equipment and methods of manufacture of equipment,

the drilling of home defense organizations, draft scenes, enlisting scenes, entraining of troops and photographs of local commissions, boards and committees engaged in public service in connection with the war. In brief, the War Plans Division desires any photographs accompanied by brief descriptive captions which show the war activities of your vicinity.

We learn that arrangements have already been made with the principal illustrative news syndicates of this country to purchase unmounted prints of this description at the nominal rate of seven cents each, which is the price at which official U. S. photographic

prints are sold to them.

While this price covers merely the actual laboratory cost of production. your coöperation in maintaining this photographic record can be based only upon patriotic grounds and the monetary returns to you cannot be an object. Most of the photographs are furnished gratuitously.

Should any privately owned pictures be eventually published, they will be published with a proper credit line to the owner on the basis of \$2.00 each for publication rights, payable on an exchange basis for official U. S. photo-

graphs.

Every photographer is in a position to render a useful public service in forwarding to the Pictorial Section War Plans Division, War Department, at Washington, for selection, such photographs as are available, or that come within the scope outlined above, and in forwarding at future intervals such pictures that should be collected as a part of this permanent record of the war. Do what you can.

THE PITTSBURG SALON

WITH a view of showing our readers the best that is being accomplished in pictorial photography in this country we devote this issue to a review of the Fifth Annual Salon of the Photographic Section of the Academy of Science and Arts of Pittsburg with a selection of representative prints sent by the Committee for that

purpose. The aim of the Salon is to present annually only work of distinction as to artistic feeling and execution. In reproducing these prints from the original it is impossible to present the effectiveness of true quality, owing oftentimes to the tone, paper and printing. Nevertheless these half-tones present the best possible results the engraver can give, and will be of interest to every worker in pictorial photography.

A QUESTION OF BREADTH

THE repose and restfulness of a picture depend very much on what is called breadth. Breadth has nothing whatever to do with size. There may be delightful breadth in a picture three by two inches, and we may have a picture a yard broad without any breadth at all. Breadth is a harmony in tone, and its antithesis is patchiness or spottiness. But breadth is not attained by massing heavy shadows together. People have for years made this mistake, and thought that by getting away from sharp focus they were attaining breadth. Too often they only achieved indistinctness. We are getting nearer an appreciation of breadth now in our best work. There are delightful portraits being produced without the retouching pencil being used—without a single high-light or deep shadow—and yet luminous and full of exquisite gradation and modelling. In the general rush of work, however, we are getting farther and farther away from breadth, we are ever becoming harder in our prints. The reason is not far to seek. Every new paper is more brilliant than its predecessor, and while we welcome the new paper we do not at once adapt our negative to it. To keep pace with the paper our negatives should be developed more softly year by year. Just take a negative of twenty-five years ago and use it on the paper of today. What hard results we obtain. negatives are becoming thin, but we keep them full of exquisite detail.

As there are in existence thousands of good negatives made for printing on paper which are too strong to give good prints on the emulsion papers of today, the worker is often at a loss to know

how to get the range of tones properly rendered; either he must over-print the shadows if detail is wanted in the lights, or he must lose much in the lights if attention is paid to the shadows. The first remedy for this state of things usually adopted is sunning down the print after printing, but this has seldom any other effect than of lowering the whole tone. A much better plan is to tint the paper before printing; the detail in the lights this way seems to get a start and a much softer print is the result. The best plan, however, if many prints are wanted, is to take the varnish off the negative and reduce it. This can be safely accomplished by soaking it for a few minutes in alcohol, then soaking in water, and afterward in hypo, and finally in perchloride of iron. By varying the time the plate is left in the perchloride any amount of reduction can be had, but the best plan of all is to print all strong negatives in carbon. A negative which will give only soot and whitewash with the modern printing papers will give an astonishing amount of half-tone if printed in carbon on tissue of a suitable color, blacks tending to hardness, while sepias and reds give softness.

If all photographers adapted their negatives more carefully to their paper, there would be less bad work turned out. The samples seen in showcases suggest in their brilliancy and hardness that the

negative is still too dense.

It is, perhaps, not altogether easy to escape from this. The papers made nowadays give us possibilities which were unknown years ago, and it is a great temptation to over-use the new power which has been put into our hands. But all brilliancy is just as bad as all muddiness, and we have much to learn in the direction of a true tonality coupled with a pleasing distinctness of definition.

LIGHTING THE DARK-ROOM

I F a law were passed or enforced which would compel photographers to work in dark-rooms arranged in accordance with rules of health, it is to be feared that a large proportion of us would have to reconstruct. It is wonder-

ful in what pokey, unventilated closets we will go to do our developing, and, to complete the misery, the light is too often very bad. This question of light is one which has not received the attention it deserves from photographers, who strain their eyes when there is no need for it.

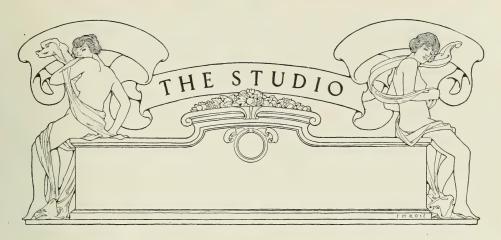
Most photographers use a ruby light, and the reason probably is that it was so in the beginning. Experiments, too, which have been made for other purposes seem to show that ruby light is the least active. But it must be borne in mind that ruby light is less luminous to our eyes than a more yellow light, and so, if we may use the expression, in substituting yellow for ruby we find less light goes further. And this latter statement is verified by scientific experiments which have been made, but a description of which would be outside the scope of this article.

Perhaps the best light is a glass of pale, yellowish-green, with two or three thicknesses of yellow paper over it. In using orthochromatic plates special arrangements would, of course, be required. In plates sensitive to green and yellow, a red light would of course be suitable. In plates specially prepared for red this light would have to be kept so low as to be almost useless, and probably for the present these plates will continue to be developed in the minimum amount of light.

It must be borne in mind that there is no light which we can use which is absolutely non-actinic—it is a question of time. Some of the best lamps are those in which the plate is shielded from the direct rays, and lit by reflected light only; and one great advantage of this is that "mixed" light can be used, that is, the light may pass through, say, a yellow medium and be reflected from a green

one.

There is now on the market several such lamps. One is made to hang from the ceiling. The center of the bottom of the lamp on which the light is fixed is made of metal, so that no direct light can fall on the work. This plan of shielding direct light and using light reflected allows a greater amount of safe light and is the light generally used in all up-to-date dark-rooms.



The Price of Pictures

There are advances in every department of private life and business life, and it is requiring some close figuring for the photographer to get by without a straight advance in prices "right across the board," so to speak. But possibly there will be found ways in which it will be possible to reduce these advances by stopping some of the leaks that many photographers have had to contend with. In a recent conversation with a photographer who has been studying this question, we learned a number of very interesting facts about the stoppage of a number of leaks that had been discovered, and which stoppage increased the net income in a very decided manner.

One feature of the method of charging for less than a dozen pictures was quite startling. Take, for example, a picture at \$5 per dozen, which is an average popular-priced picture. Formerly the range of prices ran \$3 for a half-dozen, \$1.50 for three or \$1.25 for a single print. A careful diagnosis of the cost of time and material indicated that, whereas a sale of a dozen carried a very fair margin of profit, the orders for smaller quantities yielded no profit to speak of. The scale was changed to something like this: The dozen price was maintained at \$5 as formerly, but half a dozen were priced at \$3.50, three prints at \$3, while the charge for a single print was \$2.50. The effect was to increase the number of orders for a dozen in the first place, but where the customer really wanted just a few prints the price made it possible to use the same care as on a dozen order, and yet yielded a corre-These schedules sponding margin of profit. were worked out carefully for all styles and prices turned out by this studio, and regularly quoted. There have been some customers who would argue the correctness of such a charge, but a frank explanation of the principles and costs involved met with a willingness to be fair, and the plan has met with practically universal success.

In working this out, it became necessary to be consistent and uniform, and in order that there might be no such thing as a variation in quotations the schedule for each priced picture was marked plainly in a book, which was arranged for

ready reference at the desk. It was found that this system and uniformity of price had a moral effect on the customer, and in a number of ways it was the means of avoiding complications or question over the quoted price. The customer felt that he was being quoted the same price that any other customer was getting, and that the price was the established rate in the studio. It then became merely a matter of determining whether the work was worth the price to that person, and the number who accepted the prices gracefully was flatteringly large.

Further calculations showed where a legitimate profit could be maintained by differentiating between small and quantity orders. Where outside, group or Cirkut work was made, the initial cost is the greatest, and as the quantity is increased the first cost is carried by the number of prints in a gradually decreasing price. Instead of quoting a flat price, irrespective of the quantity, accurate figures have been worked out, so that the customer may know right at the beginning what the pictures will cost if ordered in different quantities.

This calculation has resulted in materially advancing the price where one negative is made and a small number of prints delivered. But, as the number of negatives increases and the number of prints from each, the price has been reduced. This has resulted in the elimination of much abuse where customers would ask favors in the way of frequent trips and a small number of prints and demand the same price that had been quoted for quantities. It is more the moral effect of a perfect understanding at the very beginning than the actual charge for the work.

Naturally, these more systematic methods would be calculated to show more advances than reductions, and this is very true. Yet it has demonstrated that it has in nowise reduced the volume, but, on the contrary, it has tended to increase it. The satisfaction lies in the known fact that each part of the work is bearing its legitimate margin of profits, and that there is no portion of the work that is being done at a loss and eating into the profits made on other portions. It is fair to the customer, for no customer should hold the privileges of getting his work at a price that compels the photographer to charge another

customer more to make up for the loss. Every customer should stand on an equal footing, and the quantity buyer can get a better price only when he orders in larger quantities, while the small quantity buyer knows fully that he can take advantage of the quantity price if he wants to. This is getting business down to correct principles, and all photographers should study this method of pricing its product in order to maintain the stability of the trade in general and to establish his own volume and his own profits.—

Trade News.

Some Notes on Purchase and Sale of Second-hand Apparatus

At this time of year, with the promise of bright weather before us, many photographers, both professional and amateur, will be overhauling their apparatus with a view of bringing it up to their requirements for the coming season. Usually the process means the disposal of some items of apparatus, while the worker looks around for the opportunity of purchasing, at the best price he can, articles which he requires. In doing this it may be assumed that the course most usually followed is to insert an advertisement of goods for sale, or goods wanted, in one of the photographic papers. And, therefore, some few notes, gathered from experience in settling the disputes which not infrequently arise in these transactions, may be penned with the object of facilitating business of this kind.

In the first place, as to drawing up the advertisement of goods for sale. It is well that the announcement should state, exactly yet as briefly as possible, the important points of the apparatus. For example, in the case of a lens, the name of the maker, the full aperture, focal length and size of plate covered. It is best to name a definite price, and no useful object is served by beginning the advertisement with such phrases as "For sale," "A bargain," etc. This only occupies additional space and will not influence the prospective purchaser. In the advertisement, or when writing to an applicant, there should be no hesitation in pointing out any defects in the goods. Frankness in this respect will not affect the sale adversely, but rather have a reverse effect; and it may save endless correspondence subsequently with a probable beating down in price. It is an advantage, we think, for the seller to state his address; by so doing he will often be brought into touch with a buyer in his district, with whom the deal can be carried out with much less delay and trouble than by correspondence. But when dealing with buyers at a distance it is, of course, natural to expect that the latter will require to have the goods on approval in cases where their size or weight renders this a ready course. In some cases a photograph of a camera, enlarger, or more bulky goods, such as studio accessories, etc., will be sufficient as a preliminary guide to the intending buyer, and it is not a bad plan to have a few photographs in readiness for distribution for this purpose, inasmuch as they can be distributed to all the applicants and the sending of the goods on approval then carried out

in the case of those who reply after having seen

the photograph.

As regards sending the goods on approval, it is of the first importance to be satisfied as to the bona fides of the purchaser. We are sometimes astonished at the credulity shown by persons who will dispatch goods on approval to unknown individuals; or, on the other hand, will send money to unknown people advertising apparatus. In the latter class of transaction there are unfortunately people who endeavor to get inserted in newspapers advertisements of goods which they have no intention of supplying and probably do not possess. But in all these circumstances there is absolute protection for both seller and buyer in the deposit of the amount of the purchase or sale, as the case may be, with the publisher of the paper. In addition to this it is well, when offering to send goods on approval, to come to a definite understanding as to the distribution of the cost of carriage in the event of the goods being returned; also as to the time for which they may be kept, say three Usually, unless or five days from receipt. otherwise stated, the seller will pay the carriage and, if the goods are not approved, the person to whom they have been sent should pay the cost of return. It is scarcely conceivable that the day or two spent in making such arrangements as these will prevent the sale or purchase of goods, yet we not infrequently hear of sellers dispatching goods immediately in response to an application or even when noticing an announcement of "Apparatus Wanted," with the usual result that a dispute ensues as to the liability for cost of return carriage. Another point which we should like to impress upon those engaging in these transactions is that they should return goods, obtained on approval, by exactly the same route as that by which they were sent, being careful also to employ similar labels, such as "Fragile" or "With Care," as used by the sender. If these things are done the consignee (the original sender) has a better claim for compensation from the Post Office, carrier, or railway company in the event of damage on the return journey. A further and quite necessary precaution is to advise the consignee at the time of dispatch of the goods, stating fully when and by what route they are being sent. A last point which it is necessary to mention is the packing of the goods. We have been astquided at the perfunctory ways in have been astounded at the perfunctory way in which apparatus even of considerable value is enclosed in slight wrappings or put in a box without something to hold it firmly in place. Such want of care only leads to further dispute, for the recipient of goods which may arrive broken finds it difficult to claim on the carriers if he is unable to show proper packing.—British Journal of Photography.

Real Hard Work versus Useless Slavery

REAL hard work never killed anyone. The trouble is that so few photographers realize what hard work—serious work—means. The man who tells you that he has not a moment that he can call his own, that he is busy from

sunrise until bedtime, may imagine that he is working hard, whereas in reality he is only slaving without a purpose, and gradually placing himself in a position where he will not be able to do any work at all. That man has not yet been created who can and does work continuously without a let-up. The man who attempts that will sooner or later—and generally sooner than he expects—give way under the strain and be a hopeless, helpless wreck.

Real hard work means the application of one's entire energy and force tempered with enough recreation and relaxation to feed the spent

vitality.

This looks like an uninteresting subject for a photographic journal, but I am minded to write about it because I so frequently come across photographers who seem to have an utter disregard for the few rules that cover their ability to work and to produce a high grade of product. Constitutionally all of us are endowed with tremendous powers of resistance and with apparently unlimited resourcefulness, but scientists have proved that you cannot take away from the soil continuously without impairing the reproducing power of that soil. So it is with man. You cannot continuously originate or produce without every now and then giving back part of your product to yourself, or at least staying inert for a while. Otherwise you "grow stale." All of us know that phrase and all of us suffer from the complaint occasionally. It is misplaced work—overwork, usually unnecessary that causes us to "grow stale."

To be successful in any given sphere of action or business we must learn to work hard. But to be able to work hard and continuously we

must first of all have good health.

Good health we can only get from keeping temperate in our habits, from working regular hours and from getting sufficient recreation. So many of our photographers think that it is incumbent upon them to work from early dawn until all hours of the night in order to get their pictures out. They may be able to do that for awhile, but if they have any idea of staying in business more than a year or two, they will be wise if they early learn that Nature cannot be abused, that the mind and the body both need rest and relaxation if they are to do their best, and that regular hours of labor bring the best results. The keeping of temperate habits is more vital to good health than anything else, and I leave it to my readers to search themselves on that question. This is no temperance lecture, but there is no reason why the stigma of intemperance should still be so closely connected with the making of photographs.

So we see that to work hard a man must temper his labor with amusement or rest. A change of occupation is often sufficient amusement or relaxation, if it brings into play a different set of muscles and a different set of brain cells. Amusement does not necessarily mean cards or

the theater or long sessions in a café.

We all must work hard to bring success to our

efforts, and so it is a wise man who learns the few lessons necessary on the subject of regulation of his labor and temperance of his habits. To him success will be all the easier in the getting, and he will be all the better able to enjoy the fruits of his success when it comes, if he has labored well but wisely.—Exchange.

Showing Proofs

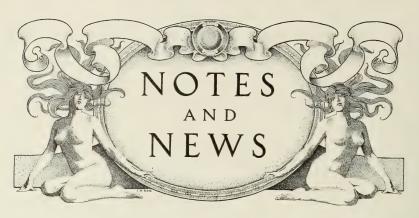
THERE is a difference of opinion among professionals on the manner of showing proofs to customers. Some believe that the best way is to get the customer to call at the studio where the proofs can be shown in proper order, in a good light, in suitable surroundings, and, most important of all, shown with suggestions and comments. Others are just as firmly convinced that the best way is to send the proofs to the customer's home where he and his family can make their selection without being influenced by the photographer or his receptionist. Those who advocate studio proofs maintain that they can very often talk the customer into giving a bigger order than he at first intended to give. On the other hand, those who advocate home proofs maintain that when a customer and his family are left to be the sole judges, a bigger order will result from the fact that it takes several poses to satisfy them. Some members of the family take a fancy to one position and some are keen on another, and the customer who wants to please everybody orders copies of several poses and makes his order up to two dozen instead of the single dozen which he intended to have at first. There's something to be said for both methods. Probably the wisest plan is not to hold too rigidly to either one or the other, but to discriminate between the different classes of customers.—Professional Photographer.

Make Each Sitter Advertise You

There are too many photographers who think the final aim is to get the money without any regard as to whether the customer is satisfied. The final aim in photography should be to make each sitter advertise your studio. This may be impossible at times because we all know there are some people in this world who will never acknowledge to you or anyone else that they have been satisfied, but if one-half or more of your customers leave your studio entirely satisfied that they have secured the best that you could give them for the money, they are going out and advertise you in a way that will bring greater returns than any other advertising which you can get at any price.

The final aim if you wish to continue in business yourself or to sell your studio at a good price sometime in the future is to see that each sitter advertises your studio, yourself and everyone in your employ.—Ohio Photo News.

When you are doing a lot of business, advertise to get some more. When you are doing no business, advertise more to get some.



The Annual Exhibition of the Bangor Society of Art, May 6 to 18, 1918, Art Gallery of the Bangor Public Library

The Sixth Annual Exhibition of Photography, Paintings, Arts and Crafts, of the Bangor Society of Art will be held in the Fine Arts Gallery of the Public Library, Bangor, Maine, from May 6 to May 18, inclusive, 1918. The exhibition will be open daily from 9 A.M. to 9 P.M. Press View, Monday, May 6, 1918, from 8 to 10 P.M.

All work will be submitted to the Committee of Selection, and will be carefully and impartially considered. No work may be removed during

the exhibition.

Address all communications (not exhibits) to MISS ALICE G. WELCH, Secretary Bangor Society of Art, 125 Essex Street, Bangor, Maine.

Report of Second Annual Meeting Professional Photographers' Society of New Hampshire

The second annual Get-together of the Professional Photographers' Society of New Hampshire held a very successful meet at Power's Studio in Claremont, March 26 and 27, 1918, with between forty and fifty present. Among the number were H. A. Collings and Charles Nelson, of the Eastman Kodak Company, of Rochester; Mr. Roberts and Mr. McLaughlin, of the Robey-French Company, of Boston; Mr. Frank Hearn, of the Ansco Company, of Binghamton; Mr. McNulty, of the Defender Photo Supply Company, of Rochester; and Mr. J. A. Dawes of the Wollensak Optical Company, of Rochester.

The meeting was called to order by President Painting, of Concord, at two o'clock. After a short business session the original program was

carried out nearly as planned.

Mr. Painting told some of his experiences in photographing children and then demonstrated his method by making some attractive pictures of two little girls.

Mr. Manahan, of Hillsboro, who has been very successful in photographing animal life, then made some negatives of a rather unruly dog

Mr. Hearn, of the Ansco Company, assisted by Mr. Dawes, of the Wollensak Optical Company, made some portrait enlargements, using the Verito lens with diffusing stops. The results well showed the advantage of this increasing popular method of making enlargements.

One interesting feature of the program was the question box, which provoked some discussion and brought out many valuable suggestions

to those present.

At seven o'clock a banquet was served (Vermont turkey) at the New York Lunch, with "Joxie" Collings as toastmaster. After an enlivening hour and a half with music and short toasts the gathering retired to the studio and listened to a very interesting and instructive illustrated lecture by Mr. Dawes on "Fifty Minutes in a Lens Factory," showing the many processes in the construction of shutters and lenses.

Mr. Ira Lindsey, of Manchester, had an unusually good exhibit of Dorotypes, showing how beautifully they adapt themselves to the delineation of fine detail in white draperies. Mr. Lindsey, the first on the program of the second day, told how he made these, showing that it is not as difficult as generally believed.

The next on the program was a home portrait demonstration by H. A. Collings, using the Eastman portrait films and home portrait outfit, making the exposures by an ordinary window. The Halldorson flash outfit was also used in this demonstration.

Mr. C. L. Powers told of some of his methods of direct advertising that have paid, illustrating his talk with portfolios for photos and a case of small frames that have proved very good business pullers.

The last on the program was a short talk on "The Business End of the Studio," by J. A. Dawes, which was given in his usual interesting manner and enjoyed by all present.

A new Simplex print dryer which had been recently installed in the studio attracted much

attention.

The following officers were elected for the ensuing year: Ira Lindsey, of Manchester, president; L. G. Ross, of Newport, vice-president; C. L. Powers, of Claremont, secretary and treasurer.

The society voted to hold its next get-together

in Manchester.

Just before adjourning Mr. Manahan in very

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fitting words presented Mr. Painting with a handsome gavel as an appreciation of his very faithful services in organizing the society and as president for the past year.

The American Institute of Graphic Arts

Photography was the subject chosen by the American Institute of Graphic Arts as the topic for its March meeting, held at the National Arts Club, 119 East Nineteenth Street, Wednesday evening, March 20.

Mr. Clarence H. White introduced the following

speakers:

Mr. Frederick E. Ives, the pioneer in the development of color photography; Mr. Lajaren A. Hiller, who has made practical photographic illustration and Mr. Thomas Bedding, formerly editor of the *British Journal of Photography*.

Copyright of British Photographs in the United States: and of American Photographs in Great Britain

THE closer relations which in the future must inevitably exist, in a hundred ways, between this country1 and the United States make it of some importance that the facts concerning copyright of photographs in the respective countries should be mutually understood. It can readily be imagined that with the more active share taken in the war by the American Republic and from the presence in these islands and on the Continent of Europe of thousands of American citizens engaged in the prosecution of the common aims of the Allies, there will necessarily come into existence large numbers of photographs which have as great an interest for the American public as for ours; and, on the other hand, photographs produced in the United States will likewise possess, many of them, an interest for people here on account of their connection with military and other operations in Europe. In these circumstances it is only fair that the rights of photographers in respect to the reproduction of their photographs should be observed in either country—those of American citizens here; those of British subjects in the United States. Such an observance obviously can only come from an understanding of the technical conditions as regards legal copyright protection which prevail in the respective countries. It may therefore be of interest to our readers, both here and in America, if we briefly outline what these conditions are.

Until the year 1909 the United States, in the matter of reciprocal agreement as to copyright protection, held almost entirely aloof from the arrangements entered into by other great nations. Until this time the only basis for reciprocal concessions of copyright was that provided by the Chace Act of 1891. Originally it applied only to books, and granted copyright to authors who were neither citizens of nor residents in the United States, provided that the books were printed from type set within the Republic. By modifications of this Act of 1897 and 1905 its scope was somewhat extended, but

in regard to photographs, its provisions never attained any degree of definiteness. Then in the year 1909 the United States Government set its house in order in respect to copyright law by drafting and passing an Act of wide scope, embracing all descriptions of work, literary, musical, dramatic, artistic, and photographic. In the present connection it is Sec. 8 of this Act which is of interest, in that it defines the basis of mutual copyright protection between the United States and other countries. Divested of a few superfluous words, Sec. 8 of the U. S. 1909 Copyright Act is as follows:

The author or proprietor of any work made the subject of copyright by this Act shall have copyright for such work under the conditions and for the terms specified in this Act: provided, however, that the copyright secured by this Act shall extend to the work of an author or proprietor who is a citizen or subject of a foreign state or nation, only: (a) When an alien author or proprietor shall be domiciled within the United States at the time of the first publication of his work; or (b) When the foreign state or nation of which such author or proprietor is a citizen or subject grants to citizens of the United States the benefit of copyright on substantially the same basis as to its own citizens, or copyright protection substantially equal to the protection secured by such foreign author under this Act or by treaty.

Such reciprocal arrangement referred to in Subsection (b) of the above was entered into between Great Britain and the United States in July, 1909, by proclamation of the President. The proclamation declares that Great Britain "has permitted to citizens of the United States the benefit of copyright on substantially the same basis" as to its own subjects.

In other words, if you, a British subject, are living in the United States at the time of the first publication of your work (photograph)which is a different thing, by the way, from the time of its production or creation—you secure copyright according to the U. S. 1909 Act as though you were a citizen of the United States. This provision will interest few photographers here for the twofold reason that few of them are concerned in rights in photographs published during their (the photographers') residence in the United States, and equally few are concerned in copyright photographs which are "published" within the ordinary meaning of that word, that is to say, placed on sale so that anyone can freely purchase them. It is the second provision (b)which chiefly provides the basis for the mutual copyright concessions between this country and America. Taken in conjunction with the Presidential proclamation, Subsection (b) amounts to this: We in this country have granted to citizens of the United States the benefit of copyright on terms such as we enjoy; the United States grants protection to us in America on terms such as *they* enjoy. At the time this relation was entered into, copyright in photographs in this country was regulated by the now repealed Act of 1864, but so far as our knowl-edge goes there is no ground for believing that the British-American relation is disturbed by

¹ Reprinted from The British Journal of Photography.

the revision of our copyright law in the Act of 1911, which in some respects, e. g., the comprehensiveness of its scope, is much more closely in correspondence with American legislation than were the previous Acts which in this

country regulated copyright.

Thus, as a first consequence of a study of the terms of this reciprocity arrangement, it is seen that subjects or citizens of countries other than the United States obtain copyright for their photographs in the American Republic in accordance with the conditions set forth in the 1909 U. S. Copyright Act. Inasmuch as the conditions provided by this Act differ radically in respect to some items from those which are now the law of the land in this country, it is necessary that photographers here should recognize the differences in order that they may comply with the necessary American formalities. far as our reading goes, we understand that the basis of reciprocal copyright between this country and America is different from that fixed by international agreement among countries subscribing to the Berne Copyright Union, according to which members of each country observe the formalities of their own country and obtain the privileges granted respectively in the other countries. The wording of the U. S. Act, however, if it is not precisely emphatic on the point, can be interpreted only in the sense that we here must comply with the formalities in the United States and obtain the benefits granted under the American Act, while American photographers, on the other hand, obtain our benefits here without the observance of any formalities simply for the reason that under the 1911 Act there are none.

But to come now to the procedure which is necessary in the United States in order legally to secure and maintain copyright. In the first place it is necessary to register all photographs with the Copyright Office at Washington. The necessary forms for registration are obtainable from the Copyright Office, Washington. That for photographs published for sale is J1; that for photographs not reproduced for sale is J2. On these forms the name and address of the applicant must be stated, the nationality (citizenship, not race) of the author of the work, title of work, and, in the case of all published works, the actual date of publication. The fee for the registration of the photograph is fifty cents when no certificate of registration is desired. It is also necessary to deposit one copy of the photograph, which must be a real photograph, not a photomechanical reproduction. This deposition of one copy applies to photographs which at the time of registration have not been published, i. e., reproduced for sale or publicly distributed. If, and when, a photograph is published a further copy of it requires to be "promptly" deposited at Washington. The word "promptly" has been defined as "without unnecessary delay," but it is officially stated that the deposit need not be made on stated that the deposit need not be made on the very day of publication. The publication referred to in these instructions for the registration of copyright claims signifies publication simultaneously in the United States and in the foreign country, e. g., the United Kingdom.

This publication determines the period for which copyright in the U. S. lasts, viz., twenty-eight years from the date of first publication.

A further regulation of the U. S. Act is that

A further regulation of the U. S. Act is that works for which copyright is claimed require to be marked "copyright" when published. In the case of photographs this marking may consist of the letter C enclosed within a circle, thus (C), accompanied by the initials, monogram, mark, or symbol of the copyright proprietor. In such cases the name itself of the copyright proprietor must appear on some accessible portion of the photograph or on the mount. These two provisions, that of registration and of marking published copies, constitute the two formalities which come within the regulations of the American Act. The first is familiar to most photographers, inasmuch as it was a feature of the legislation in this country previous to the 1911 Act; the second has never been ordered in this country in reference to photographs. As regards the privileges in America, photographs broadly rank with other artistic works, except that they are placed in a subordinate class compared with works of art as regards the damages which are recoverable in the case of infringement by reproduction in a newspaper. Such damage shall not exceed two hundred dollars (£40), nor be less than fifty dollars

 ± 10).

And now to our American friends. Under the reciprocity arrangement they are more fortunately placed as regards protection of their works in this country than are their British brethren as regards protection of their photographs in the United States. The difference arises from the broad basis of the copyright legislation in this country, which is embodied in the Act of 1911. By this Act the previous formality of registration was swept away. The simple act of taking a photograph creates the legal right in it, and no formalities of any kind are necessary as a preliminary to taking action against anyone who may have infringed a photographer's copyright. As we interpret the reciprocity arrangement—and it is the interpretation which is laid upon it by eminent writers in this country on the law of copyright—a photograph taken in America by a citizen of the United States which comes into this country obtains just the same measure of protection as if it were made in Great Britain by a British subject. We conceive that it is not necessary that an American citizen, in order to obtain rights on his work in Great Britain, should register his photographs at Washington, as he requires to do in order to make good his claim to copyright within the United States. Such an interpretation is the logical conclusion from the terms of the reciprocity arrangements between the two countries, whereby an American citizen secures for his work in this country exactly the same rights which a British subject secures in exchange for rights to a British subject in the United States such as an American citizen there obtains. The fact that those rights in America are conditional on fulfilling certain formalities, while in this country they are not, is a fortunate circumstance for American photographers, the real commercial value of which

they no doubt fully appreciate. There are many other minor issues connected with the law of photographic copyright in this country which thus become of as much interest to American photographers whose work may be reproduced here as they are to those in these islands. It would be a repetition of much that we have previously written in these pages if we endeavored further to dwell upon them for the infor-mation of our American friends. We may perhaps be allowed to say that the whole story lies ready to their easy reading in the manual Photographic Copyright, which we published from this office a year or two ago, and which our publishers can supply at a price inclusive of postage to America of one shilling and one penny (twenty-six cents).

"The Science and Practice of Photography"

This book is the result of a series of lectures by Prof. John R. Roebuck of the University of Wisconsin, and is an elementary text on the

scientific theory of photography.

The book covers quite logically the entire elementary ground of photography. Among the subjects receiving treatment are the gelatin dry plate; latent images; negative defects, their causes and remedies; lenses, including the images formed by different kinds of lenses, and their defects. There is a chapter on color photography which is valuable in the practical explanations and suggestions given. The last chapter shows how to make good pictures. Clear, simple suggestions are given, dealing with, among other things, the position, choice of subject, focal length of lens, grouping, and time for exposure and development of lens. A laboratory manual is given in the second part of the book. It suggests materials, apparatus, and also actual laboratory periods and experiments for each period. The book is commendable because of its condensed, adequate, and interesting form. It is throughout illustrated both with colored plates and small drawings.

While the primary purpose of the book is a class-room text manual, the author has aimed to make it useful to many earnest amateurs by collecting and systematizing for them material now widely scattered through the records of photography. For the aid of such workers and for the instructor many references are given to the sources which will draw attention to and aid in the study of the original work. Price, cloth, \$2.00, net. This office.

The Professional Photographers' Association of Texas

The Professional Photographers' Association of Texas will hold its annual convention, under charter from the P. A. of A., at Fort Worth, Texas, August 6, 7 and 8. Write to Mr. A. L. Blanchard, secretary-treasurer, of Hillsboro, Texas, who will send further particulars.

Coming Convention Dates

Missouri Valley, week of July 8, Kansas City, Mo.; Ohio-Mich.-Indiana, week of July 22, Cedar Point, Ohio; New England States, August 20, 21, 22 and 23, Springfield, Mass.

Business Must "Carry On"

CYRUS H. K. CURTIS, in a series of leading editorials in his Philadelphia Public Ledger, has been sounding a timely and impressive warning to American business men who are inclined to curtail their activities in the war He calls for courage in the business office which shall match that shown by our boys on the firing line. He warns that a slackening of industrial effort will lead to a paralysis of the national strength. "Progress and not penuriousness," says Mr. Curtis, "courage and not cheese-paring, enterprise and energy rather than a too timid economy, are the watchwords. Let us spend wisely, let us shun waste, let us get our money's worth. But let us remember that a dollar is like a bicycle—it stops bearing burdens when it stops rolling."—*Printing*.

Death of James Haworth

James Haworth, of the John Haworth Company, Philadelphia, died at his home, Primos, Pa., on Thursday, April 4, from pneu-monia, aged fifty-eight years. Mr. Haworth leaves a wife, daughter and son.

Mr. Haworth represented the oldest photosupply house in the United States, being founded by his father, John Haworth, in 1852, and the name not changed until July, 1908, when the John Haworth Company was incorporated as one of the branches of the Eastman Kodak Company. Mr. Haworth started in the business with his father in 1877 and was active in the firm until the day of his death.

He made friends with everybody and was highly esteemed by those who came in contact

with him.



The WORKROOM

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WASTED PLATES



THE WORKROOM

By the Head Operator



The Protective Action of Sulphite in Developers1

It is the custom to add sodium sulphite to solutions of photographic developers. Namias (Chimie Photographique, 1902, 269) says: "The chief object of this addition is to check the rapid oxidation of the developer by the oxygen of the air. The more alkaline the developer is, the more rapidly it takes up oxygen. In consequence of this oxidation the developer loses its strength and becomes colored more or less brown. Adding sodium sulphite to the bath decreases the oxidizing action of the atmospheric oxygen very much. Sodium sulphite belongs to the class of strong reducing agents and is oxidized by air, though very much more slowly than the organic developers. Consequently it protects a solution of a developer very effectively from the action of the air. The developer is much less readily oxidized by the oxygen of the air when dissolved in a reducing medium such as a solution of sodium sulphite. Consequently it keeps much better.'

This explanation does not explain anything. It sounds well to say that the developer does not oxidize readily when dissolved in a reducing solution; but we have oxygen present and therefore an oxidizing solution. Reiss (Die Entwicklung der Photographischen Bromsilbertrockenplatte und die Entwickler, 1902, 30) meets the difficulty more squarely though perhaps no more successfully.

"All developers are very readily oxidizable substances. If these substances were kept dissolved simply in water, they would be oxidized to some extent very rapidly by air and they would also change to some extent into hydrates, which have no action on the latent image. Some substance must therefore be added to the solution of the developer which shall protect it from oxidation and shall prevent the formation of hydrates. In other words, we must add something which will act as a preservative. The preservatives are oxidized more readily than the developers, and consequently protect these latter from oxidation by atmospheric oxygen. Some of these preservatives act as restraining agents with many of the developers and retard the action of the developer on the silver subbromide of the latent image. Citric acid acts in this way. Other preservatives, such as the sulphites, accelerate the development. The sulphites of the alkali metals are the preservatives most commonly used; but other substances, such as tartaric acid, formic acid, acetic acid, etc., have been used with success.

Reiss commits himself definitely to the statement that the preservative is more readily

¹ One of the communications in the photochemistry section of the Eighth International Congress of Applied Chemistry.

oxidized than the developer and therefore protects it. The only objection to this explanation is that it does not agree with the facts. Sodium sulphite is not as powerful a reducing agent as hydroquinone, for instance, and it is difficult to see how anybody could call acetic acid a reducing agent.

Sheppard and Mees (Investigations on the Theory of the Photographic Process, 1907, 153) are distinctly non-committal as to what really happens, though they reject Reiss's explanation.

At present the interaction of organic reducer, sulphite, alkali, and atmospheric oxygen offers some interesting problems. Sulphites have long been added to organic developers as lessening their tendency to aërial or auto-oxidation, and preventing the staining of the gelatin in development. This action was ascribed to a in development. This action was ascribed to a selective oxidation of the sulphite first to sulphate, the reducer being passed by. But the investigations of Bigelow (Zeit. Phys. Chem., 1898, 27, 585), S. W. Young (Jour. Am. Chem., Soc., 1902, 24, 297), and Titoff (Zeit. Phys. Chem., 1903, 45, 641) have shown that the oxidation of sodium sulphite in solution is greatly retarded by the presence of small quantities of substances acting as negative catatities of substances acting as negative catalyzers. Messrs. Lumière and Seyewetz have further shown that organic developers behave in this manner, so that we have here a case of an 'induced' or 'coupled' reaction (J. W. Mellor: Chemical Statics and Dynamics, 1904) in which the total reaction is retarded. While the oxidation of sodium sulphite accelerates that of sodium arsenite, here are two oxidations which both proceed more slowly when the two substances are present together. It appears probable that this result is due to a cycle of changes. Thus the negative catalysis with sodium sulphite has been shown to be due to the inhibition of positive catalysis (Titoff, loc. cit.), while the interaction of sulphite with quinone or quinonoid bodies probably accounts for the antioxidizing action of this, as well as its prevention of staining, since the colored bodies giving rise to this would probably be of a quinonoid struc-

Another explanation for the protective action of sulphite in the case of hydroquinone is that it regenerates the hydroquinone (Lüppo-Cramer, Wissenschaftliche Arbeiten, 1902, 20). Mees and Sheppard (Zeit. Wiss. Photographie, 1904, 2, 7) rather incline to this view. "When neutral sodium sulphite solution is added to quinone solution, a reaction takes place which produces a greenish-yellow color. With an excess of sulphite this color disappears gradually. The color appears to be due to the formation of quinhydrone. The resulting solution acts as a developer. If sodium sulphite and caustic

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potash are added together to a quinone solution, the solution becomes colorless, the odor of quinone disappears rapidly, and the solution becomes a powerful developer. In order to study this reaction more closely quinone was mixed with sodium sulphite which had been freed so far as possible from all sulphate. On extraction with ether hydroquinone was obtained and identified. The aqueous solution gave no more test with barium chloride than did the blank experiment; but dithionate was present. The reaction between sulphite and quinone consists, therefore, in the reduction of quinone to hydroquinone and the oxidation of sulphite to dithionate."

We get a very frank confession of ignorance from von Hübl (Die Entwicklung der Photographischen Bromsilber-Gelatine-platte, 1907, 3d ed., 41).

"The alkaline solutions of developers absorb oxygen from the air, become brown in color and gradually lose their developing power in consequence of oxidation. To prevent this or to reduce it to a minimum, it is now customary to add a sulphite to all organic developers. The sulphite prevents the precipitation of colored oxidation products on the silver image and therefore helps the formation of pure black negatives. It is not yet known whether the sulphite prevents the oxidation of the organic developer or whether the reaction proceeds along different lines."

If we admit that sodium sulphite does retard the oxidation of an organic developer, there are a number of possible explanations for the

alleged fact.

1. The sulphite may be oxidized more readily

than the developer.

2. The developer may be oxidized more readily than the sulphite; but the sulphite may regenerate the developer. This would mean that the developer acted as a catalytic agent, except for possible secondary reactions.

3. The developer may form a complex salt with the sulphite and this complex salt may be less readily oxidized than the developer.

4. There may be no protecting action, but half the oxygen may go to the hydroquinone and half to the sulphite. In case of an insufficient supply of oxygen this would mean an actual, though not a theoretical, decrease in the rate of oxidation of the developer.

5. We may be dealing with a case of negative

catalysis.

The first explanation may be barred out, because we know that sulphite is not more readily oxidized than the developer. While the experiments of Mees and Sheppard on hydroquinone support the second explanation, they were not conducting their experiments in presence of an oxidizing agent, and they were working with relatively high concentration of quinone. Our experiments on the silver equivalent of hydroquinone in strongly alkaline solutions containing an excess of silver bromide give no evidence of any catalytic action of the hydroquinone, and we therefore rule out the second explanation. The formation of a complex salt is quite probable, because we do have an induced reaction in the case of hydroquinone and sodium sulphite. The third explanation is a possible one provided the rate of oxidation really is cut down. Since there is an induced oxidation, there would be less oxidation of the developer in presence of sodium sulphite in case one were dealing with an insufficient amount of oxygen. To this extent the fourth explanation is correct. This would not apply in the case of pyrogallol where there is no induced reaction. The hypothesis of negative catalysis can only be possible in case there really is a decrease in the rate of oxidation in the presence of sodium sulphite. There seems to be no evidence at all on this

fundamental point.

The general line of reasoning seems to have been as follows: An alkaline solution of hydroquinone, for instance, oxidizes in the air and turns brown. An alkaline solution of hydroquinone containing sodium sulphite does not turn brown in the air and therefore it has not oxidized. This neglects the possibility, definitely suggested by von Hübl, that the absence of the brown color may be due to the reaction having proceeded along different lines. Curiously enough, there was experimental evidence in regard to this, though nobody seems to have appreciated the significance of it. Sheppard and Mees (Investigations on the Theory of the Photographic Process, 1907, 155) say that "it is of interest to note that if the solution contains a fair proportion of sulphite, and be guarded from aërial oxidation, a considerable quantity of silver may be reduced and yet the solution remain colorless. It may be concluded that in this stage no very complicated products are formed."

We have made experiments on the silver equivalent of hydroquinone in strongly alkaline solutions containing an excess of silver bromide. In a run lasting four hours and a half, the same amount of hydroquinone is oxidized whether sodium sulphite is present or not. On the other hand, there is a great difference in the color of the solution, the one containing no sulphite being very much darker than the other one. A spectroscopic examination showed that the difference in color was one of intensity and not of quality. The same coloring matter is formed in the two cases, but the absolute amount is very much less in the solution containing sulphite. This difference might be due to the fact that sodium sulphite reacted with the brown coloring matter, forming a nearly colorless solution, or it might be due, as suggested by von Hübl, to the reaction running for the most part in another way when sodium sulphite was present. To test this, sodium sulphite was added at the end of the run instead of the beginning of the run. This did not destroy the color, and therefore the cause of the solution remaining nearly colorless is that, to a very large extent, we get a different reaction taking place when sulphite is present.

The general results of this paper are as follows:

1. It has been assumed that sodium sulphite protects solutions of developers from oxidation because these solutions turn brown rapidly when no sulphite is present and do not turn brown so readily when sulphite is present.

2. When solutions of hydroquinone and sodium sulphite are oxidized, they are much less brown than solutions containing no sulphite, in

which the same amount of hydroquinone has been oxidized.

3. Adding sodium sulphite after the hydroquinone has been oxidized does not have the same effect on the brown color as adding it at the beginning of the run. The difference in color is therefore due to a difference in reaction products.—WILDER D. BANCROFT and M. A. GORDON, in *British Journal of Photography*.

Trial Exposures and Economy

In these days when universal economy is rapidly becoming a matter of necessity there is no detail of daily practice that is not worth investigating from the waste-saving point of view, and one very important detail is certainly that of trial exposures. In spite of the fact that numberless methods of estimating correct exposure exist, it is nevertheless a fact that in a vast number of cases workers prefer an actual trial, and experience shows that, after all, nothing is so absolutely reliable as this expedient. In most cases, however, the trial is made on a full-size plate or full-size piece of paper, the operator thinking that if this first trial proves a success he will have saved material. He will, of course, have done so, but the odds, in our experience, are against the success of the first attempt. It may be moderately good, but not as good as it should be, in which case quality suffers; or it may be bad altogether, which means that on this one trial sufficient material has been wasted for several trials. Indeed, it not infrequently happens that on the first trial proving a failure the second is not exactly a success, so that a third becomes necessary, and this doubles or trebles the waste.

The mistake, of course, consists in attempting to do things by halves; instead of weakly hoping that the first attempt will prove a success it is far better to decide definitely that it is to be a trial exposure, and nothing else; in which case we need not use a larger plate or piece of paper than is necessary for an efficient trial, while we can make a series of exposures in steps, so as to make sure of gathering definite information. The material used in this way is not wasted, because from it we gather definite and important information.

A trial of this type is very necessary in enlaring, while it is extremely useful in copying work when we have not the advantages of standardized illumination, etc. It is also sometimes useful for getting critical focus when this is essential, in which case we can test the effect in one or two positions of the focussing screen, both inside and outside the one position that, visually, appears to be correct. Thus we sometimes need appears to be correct. trial exposures on printing paper and sometimes on plates. The former case is easy to deal with, and the most economical way of making due provision for such trials is to take a few sheets of paper belonging to one particular batch, cut them up into suitable strips, and store them ready for use in a special box. Paper-makers generally include in each packet of cut paper one small piece especially for trials; thus in a 10 x 8 packet we may find a 5 x 4 separate piece inserted for this purpose. As a matter of fact, these are seldom so satisfactory as longer strips, and so, as a rule, we prefer to collect and store the small pieces for making small prints, and cut up one of the bigger sheets into strips for trials. There is no extra waste here, because one 10 x 8 sheet will probably suffice to give all the strips required for four packets of paper, whereas the four 5 x 4 pieces provided can do no more, and will probably not do as much, with the same efficiency.

While the use of trial strips in the case of bromide paper is not uncommon, very seldom do we see the same expedient used in the camera. Though half a quarter-plate is as efficient for a trial as a complete one, yet few will hesitate to use the latter, while we have even seen three 10 x 8 plates wasted in the attempt to arrive at the exact best exposure on a special subject, though a quarter of one plate would have been The alternative to employing strips of large plates for trial purposes is to use a small plate in a carrier. It seldom happens, however, that a small plate coated from the same batch of emulsion is available, while in any case the mere testing of the effect produced in the center of a large plate is not an adequate test for the margins, which may require just a little more exposure, or, perhaps, a reduction of the stop aperture to secure uniformity of illumination. Nothing is so reliable as a long strip that will reach the margins; therefore it is best to sacrifice one plate at the start for the provision of test

Plate strips must be cut the long way of the plate, as the only means of giving a series of exposures in strips is to make use of the shutter of the slide, which invariably draws out long-ways. A 10 x 8 plate will make four serviceable 10 x 2 strips, and if we provide also two 10 x 3 strips, cut from an old useless negative or spoiled plate, or from stiff millboard, it is an easy matter to load the slide with a trial strip centrally. It is a good plan to keep the cut strips in a plate box fitted with a central division so that the trial strips can be kept in one side and the packing-up strips in the other. If these latter are of glass, they can be covered with paper gummed on, and then they can be distinguished from the trial strips by touch. If one feels reluctant to cut up a plate into four trial strips on the ground that two or three may never be needed, a little ingenuity in mapping out the plate will provide one or two trial strips and one or two plates of smaller size. Thus a 10 x one of two plates of smaller size. Thus a 10 x 8 will cut into two 10 x 2 strips and two 5 x 4 plates; or into one 10 x $1\frac{1}{2}$ trial strip, two full-size stereoplates, $6\frac{3}{4} \text{ x}$ $3\frac{1}{4}$, and two lantern plates, size $3\frac{1}{4} \text{ x}$ $3\frac{1}{4}$. Other size plates will cut up differently, but when possible it is best to arrange matters so that pairs of smaller plates can be produced as these area more resolved. can be produced, as these are more safely stored than single plates if packed face to face. We may add one more case in which trial exposures on strips are very useful, and that is when preparing bromides that are to be sulphide toned. Very much here depends on the printing exposure, and if a strip is prepared and put through the sulphiding process the best possible results can be secured with certainty.—British Journal of Photography.

Chemical Poisoning

Some people are very susceptible to the irritating effect produced on the skin by coal-tar developers. Others working under the same

conditions are not at all affected.

The results in all cases are about the same and the same preventive measures may be used. From a digest of all the available information on the subject it appears that the chemical poisoning is secondary to the action of the alkali in the developer on the skin.

The alkali partially dissolves the outer skin and causes deep cracks to form. This exposes the under layers of the skin to attack by the developing agent and its oxidation products.

developing agent and its oxidation products. The following facts have been fairly well established. Potassium carbonate in a developer is slightly less liable to cause the trouble than sodium carbonate. This is because potassium carbonate absorbs moisture from the air and remains in solution, while sodium carbonate dries to a powdery form on the hands and causes the skin to crack. The use of potassium carbonate, however, does not prevent the trouble.

A non-alkaline developer, like amidol or acrol, does not give much trouble, although a few cases of amidol poisoning are on record. In this case also the drying of the sodium sulphite on the hands has the effect of causing the skin to crack in the same way as sodium carbonate.

It is very necessary, therefore, when working with chemical solutions to thoroughly remove them from the hands by washing with water before crystallization takes place within the pores of the skin. The reason why most poisoning is caused by developers is because it is very difficult to remove alkali from the skin by washing, especially if the skin is at all cracked. By bathing the hands in a weak solution of acid the alkali is neutralized and the salt thus formed is very readily removed by washing.

Bathing the hands in weak acid at intervals during development is almost a certain preventive, and several cases are recorded where a cure has been effected by rubbing the hands well several times a day with the following:

A 2 per cent. solution of hydrochloric acid, to be used in the same way, is also recommended.

If an acid stop-bath is used between developing and fixing, bathing the hands is done unconsciously, and several persons are known to have been cured in this way. It is very important, however, to thoroughly wash the hands in water

after treatment with the acid.

If the hands are badly stained with the developing agent the stain should be removed, otherwise it may act as a continuous irritant when the skin is cracked and its pores are open. This may be done by washing the hands in a permanganate solution and subsequently removing the stain with oxalic acid. The permanganate will cause a smarting sensation for the time being, but this is counteracted by the oxalic acid, which removes both the oxidized developing agent

and the permanganate stain and leaves the irritated skin in a better condition for healing. The following strengths of solutions should be used:

Α

Potassi Sulphu	ric acio	d (c	onc	enti	rate	d)	. 1 dra	ım
Water	. " 1"	•		•			60 oz.	
			E	3				
Oxalic							1 oz.	
Water							50 oz.	

After treatment with oxalic acid the hands

should be washed thoroughly.

Once the skin is clean and free from irritating chemicals a cold cream or ointment may effectively be used to prevent access of the developer to the under layers of the skin. Healing is sometimes aided by an ointment of the following nature:

Ichthyol						1)	1	oz.
Resorcin							1	oz.
Glycerin		1:	-1		, .		1	oz.
Zinc oxid	е.					,	$\frac{1}{2}$	oz.
White pa	raffin	oint	me	nt	. 11		6	oz.

To summarize, the best preventive is to wash the hands thoroughly immediately after removing them from the chemical solutions. When developing, the hands should be frequently rinsed in the acid stop-bath or in the wash water, in order to prevent, at any time, the crystallization of the solution on the hands. Before drying, the hands should be washed with a weak acid solution and thoroughly rinsed for one or two minutes in plain water.

The best cure would seem to be a thorough cleansing of the hands, which will remove any trace of the chemical which causes the irritation and the use of an oily ointment which will find the pores of the skin and prevent the poison from again reaching the sensitive under layers of the

skin.

The use of rubber gloves is advisable in effecting a cure, as they afford the best possible protection. In all cases it is advisable to consult a physician, as the condition of one's health has a general bearing on local affections of this nature.—Studio Light.

Economies and a Cheap Method of Negative Making

Most suggested war economies deal with the saving of apparatus and materials, and often the greater saving of time and labor is lost sight of.

For those of us to whom the war means longer hours of work and less recreation, this form of economy is the more attractive, and the best way of effecting it is by systematizing

our work and by simplification.

These considerations apply in particular to the more mechanical operations, though in the field much time can be saved in various ways by taking thought and by camera "drill."

Time-saving Methods

Development can be simplified by the adoption of the time-temperature method, using any of the excellent prepared developers on the market and the tables of development times issued with them. Very little experience is required to determine what modifications to make for any desired type of negative. This method also teaches the meaning and importance of correct exposure.

If the time-table is mounted on a card and hung up in the workroom it is less liable to be

missing at the crucial moment.

Fixing is an operation which cannot be hurried. It is best to use a 25 per cent. solution of hypo, and give twice the time required for the creamy appearance to be lost. In this way we are sure that the fixing is thorough, and thorough fixing is of more importance than thorough washing.

The time spent by many workers in washing negatives and prints is needlessly long. Many experimenters have shown that by short washes, and draining between washes, hypo can be eliminated from a negative completely in ten minutes, and our own investigations have confirmed this. For the plates we use, six washes during fifteen minutes has been in all cases found to be ample, subsequent chemical examination of the film having shown the hypo to be entirely removed. The important point, we find, is to drain thoroughly between washes.

More time is required in the washing of prints, as the paper absorbs hypo, and a longer time is needed to get rid of this. We have, however, reduced print washing to seven, of three minutes each, given by hand in large dishes, the prints being drained in passing from one dish to the other. Examination has here also shown the hypo

to be entirely removed.

Negatives are usually left to dry overnight, and while this is in some ways convenient there are many reasons why they should not be kept wet for an unnecessarily long time. By drying the back with a cloth, and very carefully wiping the surplus moisture from the film side with a fine cambric pocket handkerchief, negatives can be dried in a current of air in less than an hour.

In printing, time can best be economized by keeping to a standard set of conditions and in

general to a known type of paper.

Waste

Possibly it would come as a revelation to many amateur photographers if they were to reflect seriously upon how much they spend on their hobby. Photographic writers have taken this theme and have offered countless suggestions, some practical and many otherwise, but very few workers indeed devote as much thought as they profitably could toward avoiding waste, which is, after all, the real reason why photography has always been credited as being an expensive pursuit.

Success in camera work does not rest, as so many would seem to believe, in making an immense number of exposures. We would ask any who are inclined to believe that it is necessary to make a multitudinous number of expo-

sures in order to obtain a tew good pictures to consider how many exposures they make in the run of a year, and then to count up how many of those pictures were really successful or they really care about. We think that 95 per cent. would not be at all an excessive estimate of the waste. This is more especially the case with small sizes; it is an easy matter to look into a view-finder and snap, thinking that a few pennies will not make a great difference in the till for negative emulsion. It will not, it is true, but when this begins to happen pretty frequently then there is a difference, and the cause is senseless waste. These wasted millions of exposures in the run of a year by countless photographers represent an immense sum.

The rule should be: Consider if the subject is worth while or not. Consult an exposure meter, and give the exposure indicated. Then small sizes will be a boon to the economical worker, instead of the reverse, as is often the case at present. It is of no use to put the half-plate camera aside in favor of a vest-pocket instrument on economic grounds if of the total number of exposures made, duplicates and guesswork snapshots are to work out at

six or seven to one.

Another form of waste with many workers is the idea that a large number of stock solutions are necessary if successful work is to be the rule. For the occasional worker these are far from being economical. They lose strength every day they are kept, and should be superseded

by the tabloid form of chemicals.

We have long come to regard bromide as the most economical printing process for amateurs, and if a test exposure is made it will be found a real economy. There is no need to use a whole sheet for each negative. One may be cut into strips about 1 inch wide, and a quite sufficient area for a test will be found. This may be noted down for future use in order to secure a uniform result at any time.

A New and Cheaper Way of Making Negatives

While on the subject of photographic economy, the following communication sent us by a reader

will be found apropos:

"I thought perhaps some of the readers might be interested in knowing how negatives may be made very cheaply by means of this same paper. A piece of the transferotype paper, obtainable at most of the Kodak branches, is taken out of the packet—of course, in the darkroom—and is placed film side upward on a piece of glass cut to the size of the plate which your camera takes. Old negatives will be found the most suitable.

The glass with the paper attached is placed in the camera as if it were a plate, and an exposure is made. Very possibly there will be found a difficulty in obtaining the right exposure at once, but as a rough guide the paper which is of the bromide type will be found to require about three times the exposure of an

ordinary special rapid plate.

The paper plate, if we may so term it, is then taken from the camera and the adhering paper removed from the glass; it is then developed as for ordinary bromide paper. Metol-quinol will be found the most suitable developer for this type of negatives. The negative is then fixed as for bromide paper, and is washed for about half an hour in slowly running cold water, care

being taken not to scratch it.

The paper negative is then placed in contact with a piece of glass the same size, and well squeegeed to remove all air between the paper and the glass. The glass and paper are then placed between blotting paper and pressed. For those who do not possess a press a very good method which I always use is as follows: Put the glass and the paper, covered with the blotting paper, inside a large-sized book, and place it in the middle of a book-shelf with books each side, and then wedge as many books as possible into the shelf. This home-made press will be found very effective.

will be found very effective.

The paper and glass are kept pressed together for from half to three-quarters of an hour, when they are removed and placed in warm water (not more than 95° F.) for about five minutes, when it will be found by pulling from one corner that the paper will come away from the glass, leaving the film on it. This new negative is washed for a few minutes in running water, and then placed in a 10 per cent. alum bath for from five to ten minutes, and it is then again washed in cold running water for about ten to twenty minutes, after which it can be set up to dry and then printed from in the ordinary manner.

Of course, by this method the picture will be reversed; but this may be remedied by printing from the glass side of the negative, care being taken that only direct rays of light fall on it.

A negative formed in this way is usually a very thin one, but with good contrasts, and as a general rule it will be found to make good prints."—Amateur Photographer.

Two Useful Cements

FOR cementing any hard material, such as broken porcelain or glass, which is not required to stand heat, a very useful cement is made as follows: Gelatin is soaked in its own volume of water for three or four hours at a moderate heat, an equal volume of glacial acetic acid added, and the whole heated till thoroughly homogeneous. It should set to a stiff jelly on cooling, and if not, more gelatin should be added and the whole reheated. The surfaces to be repaired should be dry and clean and heated, the cement being applied warm with a strip of wood. The surfaces should be squeezed together and the article bound up with twine and left overnight to set. The excess can be washed off by means of a cloth and a little hot water. Where the article has to stand the action of hot water, the best cement is bichromate glue, which is made as follows: Soak ordinary glue overnight in water and pour off the excess. Melt the glue by standing the containing vessel in a pan of boiling water. To this add about one-tenth its weight of bichromate of potash in a finely powdered state, and maintain the whole at a good heat till the salt is dissolved. The

glue is applied as before, and to assist the hardening it should be exposed to light.—
Amaleur Photographer.

Good Results from Economy

While there is an amount of truth in the saying about spoiling the ship for a ha'porth of tar, there are ways even in photography in which economy can be practised without such a disastrous result. The following is a simple development system which, while doing away with the cost of plate developer and saving time, trouble, and space in mixing and keeping various solutions, will give very good results. The base of the system is metol-hydroquinone, preferably made up as follows:

This developer will develop plates, bromides, and gaslights with a minimum of waste if used thus: Develop gaslight prints with fresh solution without any addition, and when apparently used up (each 3 oz. should do at least twelve to sixteen postcard-size prints if correctly exposed), pour off into another bottle having a distinctive mark, say a letter P. For every ounce of developer add an ounce of water. For bromide prints use the developer at half-strength; that is, add the water in the dish before using, and when done pour away into bottle P without any more water. P now contains developer which would otherwise have gone down the drain; it is roughly half the strength of the original solution, and will be found excellent for developing snap and time-exposed plates. It gives good density without stain. It can, of course, be "doctored," with water if softer results are wanted, or bromide (rarely necessary) for contrast.—Amateur Photographer.

Fixed-focus Enlargers

The fixed-focus type of enlarger is generally fitted for one fixed size, as quarter-plate to whole-plate, but some have a carrier for enlarging $3\frac{1}{2} \times 2\frac{1}{2}$ to half-plate. It will be noticed that a whole-plate piece of glass is provided for laying the bromide paper on when enlarging quarter-plate to whole-plate. The difficulty now arises, when using $3\frac{1}{2} \times 2\frac{1}{2}$ to half-plate, how to keep the sensitive paper in a fixed position on the glass. How often has one experienced, when replacing the back of the enlarger, that the bromide paper moves out of position, and on developing the enlargement finding only a portion of the desired picture is obtained? My method of preventing this is to cut out a thick piece of mounting paper to whole-plate size, and then in this a half-plate opening. This frame will keep the sensitive paper from moving out of position, and should be placed on the glass inside the enlarger, and then the paper laid on top in the space cut out.—Amateur Photographer.

The Nature of a Developer Sludge1

A SAMPLE of a sludge taken from a deep tank pyro developer compounded with sodium bisulphite was found to consist mainly of fine needleshaped crystals of calcium sulphite correspond-

ing to the formula CaSO₃2H₂O.

In order to explain the presence of the calcium salt it was at first assumed that some compound of calcium had been accidentally added to the developer or that some of the ingredients contained calcium as impurity; but as only pure chemicals were employed it was concluded that the calcium must have been originally present in the water used for compounding the developer.

On adding definite amounts of calcium, in the form of chloride or sulphate, to water used for mixing the developer, it was found that the presence of 0.025 per cent. dry calcium chloride was sufficient to ensure the formation of crystals of calcium sulphite, if the solution containing the sulphite and bisulphite was allowed to stand

before adding the carbonate.

Calcium sulphite is soluble in an excess of sodium bisulphite, forming calcium bisulphite; but on allowing this solution to stand in the air, needle-shaped crystals of CaSO₃2H₂O are deposited. The absence of magnesium from the sludge in question was due to the relative high solubility of magnesium sulphite and magnesium carbonate in a solution of sodium carbonate.

Although a number of trials were made, by

compounding the complete developer with water containing calcium salts, in no case were needleshaped crystals deposited on standing, only a semi-amorphous sludge being precipitated. It was considered that the needles could only have crystallized within the complete developer if it

were mixed very warm.

The presence of a sludge such as the above in a developer is harmless if allowed to settle, though the developer is robbed of sulphite to the amount required to form the sludge. the developer is agitated, the sludge is apt to cause trouble by settling on the emulsion of the plates or films. It may be removed by filtering.

In case the calcium is present as bicarbonate, thus causing temporary hardness of the water, the formation of the sludge may be prevented by boiling the water and allowing to cool previous to compounding the developer. If the calcium is present as chloride or sulphate, in which case the water is permanently hard, this may be removed by precipitating with sodium or potassium oxalate or sodium carbonate. The oxalate treatment will also remove temporary hardness.

Tests showed that the oxalate had no effect on the fogging power of the developer when present even to the extent of 1 per cent., so that a little excess of oxalate during precipitation will do no harm.—J. I. Crabtree.

Home-made Sepia Paper

Among the processes that have always attracted the photographer who is anxious to produce pictorial results may be reckoned that in which home-made sensitized paper is employed, and for which practically any kind of

paper can be used.
We have already referred to the Cyanotype process, which is one of the simplest, but which normally gives bright blue prints; and although these are capable of being toned or altered to black, the process is not so entirely satisfactory as that in which a sepia or brown tone is produced direct. The most desirable process for the home worker is perhaps that known as "plain salted paper," which in effect is practically a P. O. P., but without the employment of an emulsion, the sensitizer being applied direct to the paper itself after a preliminary sizing. We will, however, describe this later, and refer first to the method by which sepia prints can be produced in a very simple manner, and which is well within the capabilities of the average amateur.

Practically any kind of fairly hard-surfaced paper may be used, from the smoothest to the roughest, the only point to observe being that it is a sized paper—that is to say, has not an absorbent surface like blotting paper—otherwise the sensitizer will sink into the paper itself and the image will have a dull, sunken-in appearance in the finished print. With a sized or harder-surfaced paper, the sensitizer remains on the surface and the picture is more brilliant. If, however, any particular paper is chosen that does not appear to have a sufficiently wellsized surface to keep the image brilliant in the shadows and well on the surface, it may be as well to give a preliminary sizing in connection with the preparation of cyanotype paper. It will be remembered that the operation was quite simple, the formula being:

Glucose . .

These should be well stirred with a little cold water, and a pint of boiling water added. mixture is then boiled in a porcelain dish, with constant stirring, and put aside to cool. It should then be strained through canvas and applied with a soft sponge or brush. For those who are not acquainted with the latter very useful accessory, it may be pointed out that a brush, which is ideal for the application of sizing mixtures or sensitizers (as in the carbon process, cyanotype, or the processes which follow), is made from a piece of swan's-down calico, doubled and fastened by means of an india-rubber band over one end of a strip of glass about 2 inches wide and 6 or 8 inches long. It is capable of giving a good level sweeping stroke 2 inches wide across the width of the paper.

After the paper has been well sized, it should be hung up to dry, and when dry pinned onto a board which has previously been covered with a large sheet of blotting paper, and the sensitizer applied. The sensitizer is made by taking 12 grains of good quality gelatin and swelling it in cold water for a few hours; then add 2 ounces of water and melt. Add to this, while still warm:

. 16 gr. Tartaric acid 18 gr. Silver nitrate Green ferric ammoniocitrate . 80 gr.

¹ Communication No. 62 from the Eastman Kodak Research Laboratory.

When all is dissolved and well mixed, the solution should be filtered, taking care not to expose it to too bright a light. The paper is then coated with the solution by means of the Blanchard brush, spreading it in steady broad streaks first the long way of the paper and then across, until a level coating has been given. Hang up the paper to dry in the dark. When dry, it is printed under the negative in precisely the same manner as P. O. P., in bright light, and the printing carried to the same degree. All that is now necessary is to wash the print for five minutes, and immerse in a weak solu-tion of hypo (2 ounces to the pint), until the print assumes a rich brown color. It is then washed and dried in the usual way. The process is simplicity itself, and prints of the greatest beauty can be obtained with it according to the choice of paper and negative employed. As will be seen from the foregoing, by sizing the paper and using a trace of gelatin with the sensitizer, the image is kept well on the surface, and a good deal of richness is obtained for the shadows.

An alternative method that is simpler still, in which gelatin is not employed, is to make up the following two solutions:

		1			
Green ferric a	mmo	nio	citra	te	2 oz.
Citric acid .					$\frac{1}{2}$ OZ.
Hot water					5 oz.
		2			
Silver nitrate					$\frac{1}{2}$ OZ.
Hot water					2 oz.

Mix Nos. 1 and 2 together, and make up to 10 ounces with water. The solution is then applied direct to the paper, which may or may not have received an extra sizing as suggested above, although it is occasionally advisable to give the second coating with the sensitizer to secure richer results. When dry, the paper is printed as for P. O. P., but with this formula it is not necessary to carry the printing quite so far as with the previous formula. This will readily be understood when a trial has been given to the process, as it will be found that in the after-washing and fixing the print intensifies somewhat in tone. After printing, it is washed for five minutes, and then fixed for five minutes in a plain hypo bath, 5 oz. to the pint; then finally washed and dried. During the fixing process the final color is gradually obtained, and a rich sepia is frequently secured when a suitable negative with good contrast has been employed.

If desirable, with all these processes a further toning can be given with the ordinary gold and

ammonium sulphocyanide bath.

Yet another formula that has advantages of its own can be suggested for the production of these simply made sepia prints. In this case a solution can be made up which will keep for a considerable period, and can be applied to any desired piece of paper as required. The formula is as follows:

Silver nitrate $\frac{1}{4}$ oz. Water 1 oz.

Add to this solution strong ammonia, drop by drop, to just redissolve the white precipitate. Then add dilute sulphuric acid until the odor of ammonia almost entirely disappears. To the solution now add 80 grains of the green ferric ammoniocitrate which has been dissolved in $1\frac{1}{2}$ ounces of water. This solution should be kept in the dark in a stoppered bottle, and is applied in the same manner as the solutions given above. The sensitized paper is printed as P. O. P., and the prints should be fixed in 2 ounces of hypo in 20 ounces of water.—Amateur Photographer.

Sulphide Toning

A NEVER-ENDING subject of discussion in the photographic press is that of sulphide toning. The theory is not yet understood, and there are pitfalls for the unwary that trap many workers. But though we know so little about the theory of the process that we cannot accurately describe the nature of the brown image that is produced, yet there is no doubt as to the permanency of the results. Whatever the image may be, it never seems to show any sign of fading, and all the troubles that we hear so much of are concerned with the working of the process, not with the properties of the final result.

There are several methods of carrying out the toning process, a well-known one being the prolonged soaking of the finished bromide print in a warm mixture of hypo and alum solutions. This process is very largely used by manufacturers and professional photographers, but it is not popular among amateurs, partly on account of its being slow, and partly on account of its being productive of varying results in inexperienced hands. The tones obtainable are very fine, but the amateur greatly prefers the much quicker processes that depend on treating a bleached print with a solution of a sulphide, and these are the processes that we shall deal with in this article.

A great deal of experimental work has been done on methods of sulphiding prints, and it has been proved that the final tone varies with the kind of bleaching solution used, and with the sulphide solution. The most popular bleaching solution used, and perhaps the most satisfactory one, is a solution containing potassium ferricyanide and potassium bromide. strength of this solution is not of much consequence, but it should contain rather more ferricvanide than bromide. Fifteen grains of the former and 10 grains of the latter in every ounce of solution will work well, but many use a far stronger solution. Variations in strength do not affect the result, and most people like a solution that works quickly and lasts a long time. After bleaching, the print is washed for about three to five minutes and is then sulphided. In a 1 or 2 per cent. solution of pure crystalline sodium sulphide, the print rapidly assumes a rich brown tone, and, when this action is com-plete, a few minutes' washing finishes the process, and the print can be dried.

There is no difficulty whatever in this method, and no trouble will be met with unless it so hap-

pens that some out-of-the-way brand of bromide papers that is not amenable to the process is in use. It appears that there are papers that will not work well, but these are very few and not often met with. Trouble may, however, ensue if any mistake is made in the quality of the sulphide. The pure crystalline sulphide is almost white, clear crystals like hypo, and the solution is also quite water-white. A 10 per cent. solution will keep well for months, but the dilute solution used for toning will not keep so well, and the print will not tone in a stale weak solution. If the right kind of sulphide is obtained, and care is taken to only dilute the stock solution as required for use, no trouble need be looked for.

The next sulphiding solution to consider is one in very common use, and made from what is called "pure fused sodium sulphide;" this is not in crystals, but in green lumps. One ounce should be dissolved in 10 ounces of water and then the solutions should be heated to boilingpoint. A heavy black precipitate forms, and the solution must be filtered free from this into a stock bottle. This gives a strongly colored, yellow solution that keeps well in the 10 per cent. strength as made up, but will not keep at all in dilute solution. The name "pure" is misapplied to this compound, for it is anything but pure, and its degree of purity varies greatly. Care should be taken to obtain it only from a manufacturer of repute, and any sulphide not labelled "pure" should be rejected altogether, common varieties being useless. The purest quality obtainable of the fused sulphide should be asked for. This fused sulphide is weaker than the pure crystalline sulphide, therefore a stronger solution must be used. From 2 to 4 per cent. is a good working strength. The tone it gives is also different. It produces an umber shade of brown, while the crystalline sulphide gives a stronger brown approaching "photo" brown. Both being useful colors, it is well to be provided with the two kinds of sulphide.

Durable Amidol

One of the few disadvantages connected with the use of the amidol developer is the short time which the developer remains in good working condition. The following hints may help to minimize this trouble. It is usually recommended to make the solution of working strength, but this is a mistake. If the developer is made with half or even a fourth the normal amount of water, it will keep much better; it should be diluted to normal strength as required. The water used to dissolve the sulphite should be well boiled and allowed to cool a little before adding the sulphite, the amidol being added when the solution has cooled to normal temperature. There is no advantage in making stock solution of sulphite and adding the amidol in small quantities as required except that the The mixed surplus may be thrown away. developer will keep in working condition longer than the plain sulphite solution does. The keeping qualities of this developer are much improved by the addition of a little potassium metabisulphite; say, 1 dram to 40 ounces of normal strength solution. There is a considerable difference in the quality of amidol as now sold. The best keeping samples are in bright metallic-looking crystals, which pour freely from the bottle and give an almost clear solution. Other samples, which work well when freshly mixed, are duller in appearance, and cling together as if damp. The solution is dark and turbid when mixed, but clear if allowed to stand; the solution does not keep so long unused nor does it yield so many prints before becoming exhausted.—*British Journal of Photography*.

The Preparation of Sticky Back Prints

A SUITABLE adhesive for coating the back of prints, so that on moistening the same, the print may be mounted on a suitable support, may be made as follows:

Water		5 parts	ŝ
Fish glue or liquid glue		10 "	
Glucose (liquid)		5 . "	
Alcohol (denatured) .		5 "	

Heat the water and stir in the fish glue, glucose, and alcohol. Add a little carbolic acid to prevent fermentation, and thin down with water to the required consistency.

The following modified dextrin formula also gives good results.

Dextrin (yellow) .		10 p	oart
Water		10	66
Acetic acid (glacial)		5	66
Glucose (liquid) .		 5	66
Alcohol (denatured)		 - 5	"

Warm the dextrin and water, add the acetic acid and heat. Stir in the glucose and finally add the alcohol and a little carbolic acid. Thin with water as required. The function of the glucose is to prevent the adhesive coating from cracking. If the coating is too tacky when dry, use less glucose.—Report from Eastman Kodak Research Laboratory.

Sensitizing Drawing Paper

To coat drawing-paper for sensitizing use arrow-root. Take 90 grains of Bermuda arrow-root and 7 ounces of water. Rub the arrow-root to a cream with a little of the water, then add the rest boiling hot, stirring until the solution is clear. If it does not clear, cook it two or three minutes. When cold add ammonium chloride, 60 grains; sodium carbonate, 100 grains; citric acid, 30 grains; water, $2\frac{1}{2}$ ounces. Heat the mixture and filter. While it is still warm immerse the paper in the solution, drain it and let it get nearly dry, then dip again and dry. The coating makes a foundation for any sort of sensitizing solution.

Economy and Waste

Times like the present bring matters of economy and waste into great prominence, and many things occur that serve to remind us that few people realize the difference. The facts that economy may be wasteful and waste may be economical seem to be unknown to many people. For example, some seem to think that throwing a used developer or an exhausted fixing-

bath down the sink is necessarily waste. A developer, or at least some developers, may, it is true, be restored to working conditions, but it is not necessarily economical to attempt the task, even in these times. It cannot be done without expense, and the final profit minus this expense may be considerably less than the value of the photographic work which might have been done in the same time. This will certainly be so in the case of a developer, and often will be so in the case of a fixer, for though it is easy enough to recover the silver from the latter it will not be worth while unless there is a lot of it, for it will take nearly as much time and trouble to treat a gallon of fixer as it will to deal with a hogshead full. The man who is only a very small user of hypo will gain nothing by attempting to recover the silver, though one using large quantities may gain a good deal. The attempt, however, to recover the hypo, which has been suggested, is one that will pay neither the small man nor the big one, for it is much on a par with the effort to restore a used developer. The photographer's business is to make a profit out of photography, not out of chemistry, and some of the suggested restorative processes could hardly be made profitable at all, even by a skilled chemist working on a big scale. It is not waste to throw away a used and useless thing while it is waste to save rubbish, or, as some people say, economize it." It may even be wasteful to economize on a useful thing. Hypo is now short, but if a hypo bath is thrown away when it should be it will still contain a lot of unexhausted material. It may seem economical to use it as long as it will work, but in that case prints may suffer, and the saving of the useful hypo may be more than balanced by a waste of prints, and loss of repute and custom. -British Journal of Photography.

Cleaning Up Prints

It frequently happens that photographers receive prints for copying or framing which are in a more or less dirty condition, and require some treatment to remove, at all events, a portion of the surface dirt. Some caution is necessary in setting about this work, for what would improve one kind of print would ruin another. Platinotypes are most difficult to deal with unless they can be unmounted and put through an acid bath, but much can be done by dabbing with a little stiff dough made by kneading wheaten flour with water until it is of an elastic consistency and does not stick to the fingers. Failing this, fine dry bread crumbs will pick up a great deal of the dirt, but care must be taken not to rub too hard, or some of the platinum may be removed from the more delicate half-tones of the image. Rubber or eraser should not be used, nor should the surface be wetted. Carbons are easily cleaned; as a rule a pad of cotton-wool damped with benzole or motor spirit will remove all surface dirt, but will not move any working up. The same method answers well with bromide or P. O. P., but with these soft rubber may be used, or even fine pumice powder applied with the finger-tip and gently rubbed in a circular direction. A rub

of encaustic paste or white wax dissolved in turpentine will often do wonders in removing the tarry deposit from London smoke. Old albumen prints, of which the surface is usually cracked, are difficult to clean, as any liquid tends to wash the dirt into the cracks and make matters worse. The dough treatment is the best for these, as it lifts the dirt from the cracks as well as the surface. Prints finished in water-color may be dusted only with a soft handkerchiet, and rubbed with nearly dry crumbs. If there is any sign of the color shifting, further rubbing is dangerous. White margins may be cleaned with soft rubber; the green variety is the best for this purpose.—British Journal of Photography.

The Sink Waste

A CORRESPONDENT recently mentioned the contention of a builder that he had blocked the drains with "chemical stuff." It is difficult to block any reasonable "drain" with the material put down a photographer's sink, but it is extremely easy to block the waste pipe leading from the sink to the drain, and we have known, several instances in which carelessness has led to such a result. People are apt to think that almost anything is capable of passing down a sink pipe, and, instead of using the waste only for liquids, permit such things as cotton-wool, gelatin, corks, etc., to fall into the sink and expect them to get out again somehow. Cottonwool is used largely in some dark-rooms, and old pledgets are dropped quite as a matter of course into the sink. They may or may not block the pipe, but if they do they are capable of giving a lot of trouble. Washed off paper labels and old corks will at times form most effective plugs. More substantial material, such as paper or cotton-wool, can be stopped by a grating at the outlet, and such a grating should always be provided. We know of one case in which a pipe was plugged by a bottle brush which was dropped accidentally into the sink, and vanished down the open waste before it could be rescued. This kind of thing can readily happen, and a suitable grating is the only safeguard. Another source of trouble is not a stoppage but a leakage, caused by pouring away strong acids. None but very dilute acid should ever be allowed down the sink.—British Journal of Photography.

A Warm Dark-room

WE recently commented on the fact that operators, when compelled to warm a developer, frequently overdo it, and so spoil the negatives. It is, in fact, a not exactly easy, and generally very troublesome, operation to warm up a developer to just the right temperature, while the developer is not the only solution that works badly when cold. In practice it is far better to give up attempts to get individual solutions to a uniform standard temperature, and instead to adopt some method of warming the whole room. This can be done without much difficulty nowadays, as numerous types of gas stoves, gas radiators, hot-water radiators, etc., are available, and the cost of running,

which need not be great, should easily be ball-anced by the efficiency gained in working details. The advantage of keeping the room temperature constant is that all the solutions which are stored in bottles, or in use, also keep constant, the one thing not affected being the tap water. This one defect is easily gotten over by keeping a supply of water, especially for mixing with solutions, also stored in the room. We use a large stoneware barrel or crock fitted with a tap, and so cold water from the main need not be used at all except for washing purposes. The exact temperature of all the stored solutions is recorded by a thermometer kept permanently in a bottle of water, and so long as this bottle shows a fair mean temperature we know that our solutions and water supply are also all right for use.—British Journal of Photography.

Exposing on Line Subjects

THE ideal negative of a black-and-white line subject should, of course, show quite transparent lines on a perfectly opaque ground, but these conditions seldom exist in the developed plate and have to be arrived at by after-processes of reduction and intensification. As a rule it is impossible to avoid a certain amount of veiling or fog over the lines, and so a reducing or "cutting" solution is always necessary, but if the background is not black enough at the start it stands a chance of being so much further reduced by the cutting solution as to render it difficult to get enough opacity, even with a powerful intensifier. The best initial negative can only be secured by taking pains over the exposure. If the time is either too short or too long it is impossible to develop up to blackness, while, in the event of the time being too long, additional veil is thrown over the lines. The exposure must therefore be rather nicely adjusted, and at the first attempt it generally pays to make a trial set of exposures in strips. It must, however, also be remembered that we cannot get full contrast in the negative unless it exists in the original, and a black-and-white drawing will not show this full contrast unless it is sufficiently well illuminated. If the light is too dim the drawing will not really be black and white at all, but black and gray, and it will photograph as such, showing transparent lines on a gray ground, instead of a black opaque one. Good light is essential for this kind of work, and, given brilliant lighting and a correctly adjusted exposure, it is quite possible to get a jet-black ground that will need no intensification.—British Journal of Photography.

Degrees of Permanence in Photographic Prints

In these days when processes which yield prints of unquestioned permanence such as carbon and platinum form only a small proportion of the immense output of photographs of various kinds, and when also many different methods of toning prints by other processes are adopted, the question of permanency is one which has an interest for every photographer, and is, moreover, one of which a photographer who sells his work needs to have some fairly

comprehensive knowledge. It may therefore be of interest to review the question from the point of view, not only of making prints of the utmost permanence, but also from that of satisfying customers as to the quality of prints in this respect. In this inquiry it is desirable at the start to obtain some more adequate definition of permanence than its dictionary meaning of "continuance in the same state or without any change which destroys form or character." The dictionary definition does not help us very much. Another which has been proposed is that a permanent photograph is one the image on which will last as long as the paper which supports it. This again is a definition which is incomplete unless certain conditions under which the print is kept are specified. Moreover, it is one which marks too high a standard of permanence. Paper, if of the reasonably good quality which is used for the preparation of photographic printing materials, may reasonably be relied upon to last for a very long term of years. In the case of paper of such high quality as is employed in the making of platinum prints its period of life may be of the order of hundreds of years, and would thus make great demands on the stability of the image. True, a black platinum print possesses an image which is so unalterable that it rivals its paper support in permanence, and justifies the remark of Mr. Chapman Jones (in Photography of Today, p. 196) that "there seems every reason to suppose that if platinum prints had been made in Abraham's time, or when Egypt was at the height of its glory, they might, if preserved with reasonable care, have been available for our information at the present day." Unfortunately such considerations as these will lead us nowhere in the direction of providing a definition of permanence in photographs such as can be adopted for practical purposes under presentday conditions. We think that such a definition is to be found only in some formula representing what the public considers permanence. Opinions will differ, but such a formula is that no marked alteration will be observable in prints, when kept under reasonable conditions, within a period of, say, twenty years. We are now speaking of prints belonging to the vast majority which are bought and sold as portraits, views, etc. Obviously twenty years would be much too short a time for prints in which permanence is a prime desideratum; such prints would be expected to last for fifty or a hundred years. Whatever may be thought of such a definition, it provides a useful basis from which to explore printing processes in regard to permanence, and to bring together facts of interest to amateur photographers and of service to professionals in dealing with their customers.

A point which requires first to be touched on is that of what may be termed "permanent" photographic processes, as this phrase is (or was) understood in ordinary speech. In regard to this it may be said that up to within ten or fifteen years ago a photograph by a "permanent process" meant one by either the platinum or carbon process. There is a very good reason why it had this signification, for during the twenty-five to thirty years during which albu-

same significance.

menized paper was the printing method in universal use, carbon and platinum prints were the only two forms of photograph which could be said to have established themselves in the esteem of the public as yielding prints of unquestioned permanence, and in this respect were distinguished from the ordinary silver prints with their liability, particularly in later years, to fade. Thus up till about ten years ago it could reasonably be said that in the County Court sense a permanent print was one in platinum or carbon. And it would then have been easy for the party to a legal dispute to show that such was the general interpretation of the term in the trade. The advent of bromide and other printing papers has done a good deal to disturb that position, and it is very doubtful whether the term "permanent photograph" now has this

Coming now to some notes on the degrees of permanence in photographic prints, it is important to draw distinctions between them, not on the basis of single specimens which have been proved to have lasted for such and such a number of years, but on one which expresses what is the quality of permanence of the great bulk of prints produced by a given process. There is a sharp distinction between the two. It would be easy to claim exceptional permanence for, say, print-out silver prints on the strength of one or two which remained fresh and good after twenty years. But the essential difference between the admittedly "permanent" processes (carbon and platinum) is that with them it is a matter of difficulty, almost of impossibility, to make prints which are not permanent, whereas in the case of almost all other printing processes the degree of permanence is largely conditioned by the care and experience exercised in working the processes, and thus the real quality of a process as regards permanence must be judged on general experience of the results obtained with it, and not by single examples which may be the result of care and skill which the process would not receive under ordinary commercial conditions.

Leaving now carbon and platinum out of consideration, there can be no doubt that the most permanent form of photograph among the papers available at the present time is that on a bromide or gas-light paper. Such a print, if properly made and mounted and preserved under suitable conditions, should amply fulfil such a requirement, as regards permanence of twenty years' life. The effect of time upon it, when it is mounted and framed, should never be more than a slight yellowing of the whites, and need not necessarily be that. By exposure to the products of combustion from gas or stoves such prints are liable to exhibit, in the course of time, a bronzed or semimetallic deposit, chiefly in the shadows, which is a certain disfigurement, but not one which could be reasonably called impermanence. The same effect is to be noticed when prints on these papers remain in contact with ordinary printing paper as they do when inserted in books. Such action appears to be due to matter in the paper with which the photograph is in contact, and plenty of evidence as to the regularity of the effect is to be found in the prints which formerly, from about the year 1887, were inserted in the "B. J. Almanac." In some cases this bronzing or solarization has reached a point at which it is a marked disfigurement; in other cases it is accompanied by

pronounced yellowing of the whites.

A sulphide-toned bromide, however, is less liable to this bronzing, and for the very plain reason that the bronzing is a species of slow sulphiding, and, if the sulphiding process is carried out thoroughly when toning, there cannot be the opportunity for its often irregular appearance in process of time. In this respect undoubtedly sepia prints made by the bleach and sulphide process are superior to those yielded by hypo-alum and similar toning processes in which the sulphiding action is not carried to a point of completion. Generally speaking, sepia bromides, by either process, may be considered as of a higher degree of permanence than the untreated black-and-white prints. We do not think that the same can be said of the warmtoned prints which of late years have come rather more into use and are produced by treating the sulphide-toned prints with a gold toning bath. Attractive as these effects are, we think there is evidence to show that they are somewhat susceptible to change by exposure to light. The change is small—some years ago we found that some months' constant exposure to ordinary daylight was necessary to produce a distinct change—but the liability does certainly exist. Of other toning processes which, before the sulphide method became popular, were largely employed, it is not possible to speak in the same terms as of sulphide-toning. Prints toned with copper or uranium are exceedingly liable to exhibit, in the course of a year or two and often sooner, bronzing and other disfigurements which are of a degree such that the puchaser of a print would quite reasonably object to. Our experience of prints toned with Schlippe's salt is small, not enough to justify us in expressing a positive opinion; our inclination is to place them in a category somewhere between those sulphide-toned and those treated by one or the other of the processes just mentioned.

Coming to what are sometimes called even nowadays "silver" prints, those on ordinary P. O. P. require to be placed in a lower class as regards permanence than black-and-white bro-They are appropriately so classed when toned by the best method, namely, the use of a separate gold bath followed by fixing. Although in theory the use of a combined toning and fixing bath should yield prints which are just as permanent as those separately toned and fixed, there can be no doubt that P. O. P. prints by the combined method rightly rank still a little lower. In regard to those toned with platinum, a process which deservedly has now largely gone out of use, the results were often of a very low degree of permanence indeed; apparently the use of any platinum toning bath on a gelatin paper yields results which cannot be depended upon for permanence. The other variety of silver printing paper, viz., self-toning, may, we think, be broadly classed, without injustice to it, with the results obtained on ordinary P. O. P. by the combined bath. Here experience is somewhat conflicting; probably for the reason that

self-toning papers, being chiefly used by amateurs, are not always handled under the best conditions for working which papers secure in professional establishments. Still, we think that general experience is to the effect that their permanence is a little inferior to that of P. O. P. toned in the separate bath. A distinction must also be drawn between gelatin and collodion selftoning papers; there seems no doubt that those of the latter class are superior to those of the former in stability. Of the remaining type of silver printing paper, namely, collodio-chloride or C. C., there is greater divergence in the matter of permanence than in the case of per-haps any other paper. The impermanence in this case takes the form not usually of general fading or yellowing, but that of the appearance of spots often within a very short time of the prints having been made. Worked under the best conditions and with the fullest knowledge of the precautions which are needed in its manipulation, C. C. paper is no doubt capable of yielding prints which are the equal, if not the superior, of those on ordinary P. O. P. toned by the separate bath. But in less skilled hands its results have often proved to be positively fugitive, a chief cause no doubt being the necessity of removing all traces of the acid platinum toning bath before the prints are passed on to fixing.

In concluding these notes we should revert for a moment to the platinum printing process of which we have spoken above as though its results were invariably of the very highest degree of permanence. An exception to this general statement needs to be mentioned. While nothing in the way of a photographic image is more permanent than that of a black platinum print, the same cannot be said of all platinum prints of sepia color. Methods of introducing a greater or less degree of warmth by additions of mercury, etc., to the developing bath when using the black paper almost all of them represent a sacrifice of undoubted permanence to pleasing appearance. Also, we think it may be accepted as true that for really permanent sepia results on the papers especially manufactured for this effect hot development is an essential factor. Such is the method adopted for the sepia paper of the Platinotype Company, and both chemical tests and those of time fully prove that the results are permanent. Equally we have in our possession plenty of examples of sepia platinum prints in the making of which the method adopted has been that of cold development on papers manufactured for use according to this system; they show the pronounced fading which is the result of ordinary exposure in moderately lighted rooms over a period of years which is not more than ten at the outside. Palladiotype prints, recently come into use as the result of the restriction on platinum, presumably are just as permanent as those by the ordinary platinum process. This is only an inference from the known properties of palladium metal, but it is no doubt one which experience, as time goes on, of palladiotype prints will confirm. We have not referred to oil or Bromoil prints or those transfer effects obtained by taking impressions from these latter. Obviously such prints possess exactly the permanence of the inks which are used for pigmenting. There is no reason whatever why these inks should not be fully permanent, and therefore such prints, both from the nature of the pigment which forms the image and from that of the medium which hold it, deserve to rank as fully the equal as regards permanence of those by any process.—British Journal of Photography.

Covering Power and Illuminating Power of Lenses: Tests and Performance

A RECENT article by Mr. Graham M. Nicol, on the covering power of lenses, raises some points with regard to lenses that are certainly not generally understood, though their practical importance is very great, and some of these points are well worth more detailed consideration. The first to demand special attention is the distinction between covering power and illuminating power. The best way to realize this is to take an ordinary quarter-plate R. R. lens and fix it up temporarily on the front of a large camera, 12 x 10, if available. First of all, open the lens out to its biggest stop aperture, and secure approximately sharp focus on the screen on any object at a reasonable distance, say 20 feet away. Now remove the focussing screen and look obliquely through the lens. At a certain angle it will be seen that no light is transmitted at all, the two sides of the visible aperture apparently closing together and cut-ting out all light. Obviously this angle must mark the limits of the largest possible circle of light that the lens can project upon the plate. Next look through the center of the lens. A perfect disk of light is then seen, but as we move the head sideways this contracts to an ellipse. At a certain angle this perfect ellipse changes to an imperfect one, with pointed instead of rounded ends; in fact, to the shape of the aperture formed by sliding two elliptical openings over one another, but not allowing them to coincide. This change in form is due to the lens mount interfering with the light. Up to this point we simply had an oblique view of a circle, which is an ellipse. We now have an oblique view of parts of two circles which apparently intersect, one being the circular stop aperture and the other the circular lens mount. The angle at which this change takes place is obviously the one limiting the illuminated disk which can be produced by light passing the full unobstructed stop-aperture of the lens, and this circle it is convenient to call the circle of full illumination, while the other may be called the extreme circle of illumination.

Suppose, now, we reduce the stop of the lens. It will be found, on trial, that the circle of full illumination has enlarged, though the extreme circle has not changed. If, however, we change the R. R. for a lens of unsymmetrical construction, the extreme circle will also change; it will become smaller as the circle of full illumination becomes larger if we use the type of lens called the single landscape. What happens to the extreme circle is, however, of small moment, for in any case the illumination near its boundary

is so faint as to be photographically of no value. In fact, it is almost impossible to record its limits.

As the ellipse shown by a circle viewed obliquely is necessarily of smaller area than the circle itself, it follows that at the margin of the circle of full illumination the light is rather less than it is at the center. The diminution is not much, and as the ordinary plate has considerable latitude it is not beyond its capacity to render this really graduated disk as if it were a uniform one. If, however, we go outside the circle of full illumination the visible aperture is very rapidly and materially cut down by the lens mount, and sooner or later we reach an angle where the production of a uniform disk on the plate is impossible. The limits of this angle depend a good deal on the plate and on the exposure, for a plate with great latitude will permit considerable over-exposure in the center without showing it. Under-exposure on any kind of plate will show a very small uniform disk, but if that plate will permit a considerable increase without spoiling the center of the image a larger disk of uniformity can be produced. Leaving out the question of plate and exposure makes it difficult, if not impossible, to define the limits of the angle, but seeing that many plates will permit a doubling of what is really a correct exposure, without showing overexposure, it is convenient to define the circle of uniform illumination as limited by the angle at which the pointed ellipse represented the lens aperture is half the area of the complete circle seen centrally. This angle is termed the angle of semi-illumination, but it should be understood that the definition is a more or less conventional one, probably not far from the truth in most circumstances, but almost certainly well away from it in others.

An actual test giving varied exposures is the only way of arriving at the true maximum limits, and if we start with a very short exposure such a test will be very interesting and instructive, though somewhat expensive. The facts can be illustrated in cheaper fashion by using bromide paper, but the result will afford no criterion of the effects producible on a well-coated negative plate, as the bromide paper has no latitude at all in comparison. It should be observed that with nearly all large-aperture lenses the circle in full illumination is very small; with many not much bigger than half a crown. The most rapid and highest class anastigmats will produce much the bigger circles, but in practically all cases we use plates that require still bigger circles to cover them, so the practical limits are always outside that of the circle of full illumination and near that of semi-illumination. This circle also enlarges as the stop is reduced, and not uncommonly we are compelled to stop down to get sufficiently uniform illumination over the

plate in use.

It will be noticed that in considering this matter of illumination, as it affects the area of a plate, we are almost obliged to bring in the word "cover," for none other seems to serve. The term "covering power" may be used in this connection, but it is best not so to use it, for in lens catalogues usually this expression does not imply the size of the angle or circle that the

lens will cover with uniform illumination, but that which it will cover with good definition, a different matter altogether, and one quite unconnected with the other. Unfortunately, this conventional definition is not always observed, and so confusion has arisen. Some very good lenses have very small covering power compared with their power of illuminating a plate uniformly, and this may be no disadvantage, but it would be a somewhat awkward matter for a dealer to explain to a purchaser whose knowledge of lenses was very limited, and the former could hardly be blamed if in such case he used "covering power" to define the case he used covering power to define the circle of good illumination. An example of such a lens is the Petzval Portrait, which, tested on a plane object, will show very small covering power, but on a suitably curved object will show it to a very considerable extent. The fact is we cannot fairly test all lenses for covering power in the same way. The form of the object surface comes in. An anastigmat or rectilinear may, with more justice, be tested on a plane surface, and the former will have little to recommend it if it does not show a fairly large circle, bigger than any R. R. can produce in the same conditions and much bigger than that which a Petzval may show. But always the type of lens and the purpose for which it is required must be considered. Just as the size of the circles of full and semi-illumination increase as the stop is reduced, so also should the circle of good definition, if the lens is at all a reasonably good one. The most serviceable lens is one that with a moderately small stop will cover the plate with both even illumination and good definition, and one of the most important differences between good anastigmats and R. R.'s is that the former will do this with much the larger stop, the result being that as a rule they require only a half or one-third the exposure. This brings me to another of the points referred to by Mr. Nicol. He mentioned several cases in which R. R.'s would serve just as well as anastigmats, and several ways in which photographers could waste money on expensive lenses when cheap ones would have done all they required. The fact seems to be that many photographers do not quite understand what is meant by a high degree of correction in a lens, and place a value on it that their requirements do not justify. First of all, we must premise that no lens is perfectly corrected. If we test two lenses, an R. R. and an anastigmat, at a certain moderately oblique angle, and use a critical test, we shall find astigmatism in both of them. It must be clearly their in the first test in the control of the them. It may be clearly obvious in the first lens and only just perceptible in the other, but Clearly the anastigmat is the it will exist. better corrected, but still not theoretically perfect. Next test both lenses by exposure on a test subject. The chances are that the aberra-tion is not visible in either. The small defect that our microscopic test revealed is marked by the inherent defects of the photographic process. A minute spreading of the light effect, or lack of sufficient resolving power in the plate, or perhaps lack of minute detail in the subject, has rendered the lens defects quite invisible, and, therefore, negligible. It is then evident that

the R. R. is doing the work quite as well as the photographer can desire, while the anastigmat is merely an instrument of greater precision than he needs. At bigger angles he will find marked differences, while always the anastigmat should be the quicker lens, but if he does not use wide angles or short exposures he can do without the

anastigmat quite easily.

Yet another point is that the special advantages of the anastigmat are often arrived at by various means of compromises. A little of the critical definition possible in the center of the field is given up for the sake of getting something more important. It has been said that for fine central definition no lens yet made comes up to the Petzval Portrait, while it is certainly a fact that some good R. R.'s will give central definition of a kind that should satisfy the most critical photographer. Somehow or other, when an extremely fine focus is required, even though on only quite a small area in the center of the field, the tendency seems to be to rush for an anastigmat, when all the time a much cheaper lens would do the work just as well and very possibly even better.—British Journal of Photography.

Perspective in Portraiture

In considering the subject of perspective in relation to photography there are several points which must never be lost sight of. One is that the laws of linear perspective are unvarying and incapable of any modification. Another is that a non-distorting or rectilinear lens gives absolutely correct perspective no matter how ridiculous it may appear in the photograph, and a third is that there is no absolute standard or limit to what is usually regarded as correct perspective. Thus, so far as pictorial work is concerned, we have to satisfy an instinctive perception of what is correct, and therefore pleasing, rather than to work to any definite rules. In landscape work there is much latitude. We may make a stone the size of a brick assume the dimensions of a small boulder in the foreground of a picture, and still secure a pleasing effect; but in portraiture everyone has an intuitive sense of proportion and, according to his degree of artistic training and natural power of perception, can discern what appears to him to be an outrage upon it. In some subjects such an unpleasant effect is apparent to the least artistic observer, as in cases where the feet of a sitting figure are pointing to the camera or where the hands are disproportionately large; but in the cases of head and bust pictures there is often merely a vague sense that something is wrong and that the portrait is not a success rather than any clear idea of where the fault really is. The amount of apparent distortion is to a great extent dependent upon the pose and also upon the facial peculiarities of the sitter, and may at times be introduced with positive advantage. The portrait of a sitter with an insignificant nose may be taken from a much nearer stand-point than would usually be advisable, and yet the result would be entirely satisfactory. When the subject is a full-length figure the effect of too near a stand-point manifests itself in various

ways; the hands, if in front of the figure, appear too large, while the head or feet, or both, according to the height at which the lens is placed, seem to be inclined toward the edges of the This effect can best be explained by taking an extreme instance. Let us suppose a test object comprised of a dozen busts identical in every respect, and that these are arranged in a straight line at right angles to the camera and photographed with a Hypergon lens placed with its axis opposite the center figure at such a distance that its full covering power is utilized, the angle being about 130 degrees. When we have made a negative of this we shall find we have a full-faced portrait of the center bust, and from that a graduation to almost a profile of the outermost ones. Such conditions would not, of course, occur in the studio in any degree at all approaching this case; but to a very slight degree they occur in every photograph, becoming more apparent as the distance between lens and sitter is reduced. In the late Mr. Dallmeyer's "Telephotography" there are two three-quarterlength boudoir portraits, one taken with a 16-inch lens, which most photographers would consider quite long enough in focus, while the other is taken with a telephoto lens at about double the distance. The first picture would pass muster in the ordinary way, but when compared with the second we see that the hands are too large and that the proportions throughout are unpleasing. Another defect is the dwarfing of the background, which is apparent when there is any decided design upon it, this being made to appear too distant and altogether inadequate to the needs of the picture.

It is impossible to lay down any hard-and-fast rule for distance between lens and subject, but it may be assumed that for normal conditions 6 feet between lens and sitter is the minimum for bust portraits, while 10 feet would be better. Twelve feet is the minimum for full lengths, and 20 is preferable. It must be remembered that the perspective obtainable from any given position is the same no matter what the focal length of the lens or size of plate may be. These simply affect the size of the image, the relative proportions remaining con-Naturally, the worst examples of perspective occur when attempts are made to take large heads with a lens of moderate focal length, and this was exemplified in the competition for the prize given by Mr. Robert Crawshay for large direct portraits many years ago. This competition evoked a collection of monstrosities, which caused the public estimation of photographic portraits to sink to a very low level. Few of these pictures were taken with lenses of a greater focal length than 30 inches, and as many of the heads were actually life size the distance at which they were taken could

not have been more than 5 feet.

A word on the use of the swing back in connection with this subject is necessary, comparatively few operators having a correct idea of the effect of the swing in portraiture, as distinguished from architectural work. In portraiture the swing is used solely to enable a large aperture to be employed, and this is always achieved at the expense of correctness of drawing;

by its use the perspective is actually falsified, the picture plane being no longer at right angles to the axis of the lens, therefore great caution must be exercised, and a smaller stop used whenever possible. Some of the older portrait lenses with much curvature of field and little astigmatism are better for sitting figures than the best modern lenses, as the knees and hands come naturally into focus with the plate in its normal position. The moral of all this is that it is necessary to know the laws in order to be able to break them successfully. If you have a "physical culture" sitter, find out which particular muscle he wants emphasized, get close up to it, and give him unbounded satisfaction. A small head and a big biceps will here "fill the bill."—British Journal of Photography.

Lettering Negatives

It is at times necessary to write or print some title on a negative. The most common way to obtain black lettering is to scratch the film away with a darning needle or sharp penknife and leave the letters clear glass. If it is wished to have black letters on a small strip of white, paint a narrow strip of Indian ink or other opaque substance on the face of the negative, and when it is dry scratch out the letters carefully. This will give black letters on a white ground. Another way is to bleach out the letters.

The white letters are somewhat simpler than black ones. Write on the negative with a pen filled with Indian ink, and the opaque ink will protect the paper and leave white letters. Or use ordinary ink with a very little mucilage mixed with it, and before it is quite dry carefully dust a good deposit of lampblack over it. If the reversed writing bothers, write the title in copying, mixed with a little yellow or vermilion, to make it non-actinic, or with ordinary ink to which a little glycerin has been added, on a slip of paper. Then dampen the negative where the title is wanted and lay the inked side of the paper on the spot and leave it under pressure for a few minutes. Then peel the paper off, and a reversed copy of writing will be left on the film.

Or take a small piece of thin talc and write the title on it; then cement the talc with a transparent varnish to the film, with the writing in contact with the film. It will then be reversed. If white letters are required on a patch of black ground, cut away a small strip of the film, leaving clear glass only. Then write the title backward, in Indian ink, on the clear space. This is

simpler to do than describe.

Another method giving white letters on silver prints is to write the title on the paper (before printing), using gamboge and a fine steel pen. Then print in the usual way and the paint will wash off in the water, leaving white letters. The other plan is to write with a chemical ink (after toning and fixing) on the dry print. Such an ink is made thus: Potassium iodide, 40 grains; water, 2 drams; iodine, 4 grains; gum acacia, 4 grains. Write on a dark part of the print, and as soon as the letters turn yellow, immerse the print in a fixing bath for a minute or two, and wash thoroughly.

Glass Cutting

THE photographer is often faced with the necessity of cutting glass, yet often shirks it and calls in the aid of the professional glass-The stereoscopic worker can save a vast amount of time if he cuts his negative and mounts the two pictures in their proper relative positions on a cover-glass, for then he can produce prints on single sheets of paper that can be readily mounted in one piece. Further than this, he can produce transparencies without using more or less complex special printing frames that take up much time in use and require special care in exposure. The professional worker is, however, more directly interested in cutting glass for framing purposes, for it is much cheaper to buy the glass in large sheets and cut it oneself than it is to buy it in various ready-cut sizes. Many do not attempt to cut glass because they are under the mistaken impression that glass cannot be cut properly without a diamond, while a good diamond is expensive and also difficult to use. That diamonds are expensive is more or less correct, for though the second-hand price of a diamond is only about two or three dollars, yet it is so readily damaged and rendered useless that it is seldom safe to buy any but new diamonds. New ones of good quality, however, only cost from about five to ten dollars, so the price is not very outrageous, and most professionals would find a diamond to be a fairly good investment if they took proper care of it. There is no particular difficulty in using the diamond, and a first attempt should succeed if it is remembered that it is not the point of the diamond which is the part used for cutting, but the cutting edge which comes into play when the sloped end of the steel mount is approximately parallel to the glass surface. When it is cutting properly the only sound made is a faint squeak. A rasping, scratching noise means that the diamond is not cutting, only scratching the glass, and with a good diamond this effect is produced only when the tool is being held too upright or being used with too much force. Three different kinds of diamonds are sold: plate diamonds for thick plate glass, sheet diamonds for thick sheet glass, such as that used by glaziers, and crown diamonds, for thin sheet glass, such as that used for photographic plates and picture framing. The crown diamond is good enough for general use, and its price varies according to the actual size of the stone, not necessarily with its quality as a cutting instrument.

The only alternative to the diamond is the wheel glass-cutter, and while the cost of this varies from ten to twenty-five cents, it is really just as serviceable to the photographer. It is of no use for extremely thin glass or for thick plate, but for ordinary sheet glass it is very effective. It is, perhaps, to be preferred by photographers, for two reasons: first, it is easier to use than the diamond for cutting dry plates in the dark, which is sometimes a necessary operation; and it is more reliable for cutting old glass. Glass which is old and of poor quality will not cut readily with the diamond—that is to say, it will not break loang the line of the cut; but

it is rare to meet with glass that will not yield readily to the wheel cutter if the tool is sharp and in perfect order. This is one reason why glaziers prefer the wheel for general use. Sharpening the wheel is quite a simple operation, though it takes a little time, owing to the hardness of the steel. Take a soft piece of straight grained wood and run the wheel along the grain until a groove fitting the wheel edge is formed. Then take a sharp knife and run its point along the bottom of the groove so as to deepen it where the wheel cutting edge comes. Sprinkle some very fine carborundum or emery powder over the groove, add a drop of oil, and then run the wheel backward and forward in the groove for three or four minutes, pressing it against the opposite sides of the groove alternately.

In selecting a cutter, pick out one with a thin wheel and see that the edge is sharp all round. In use, press more heavily than with a diamond, which requires only very light pressure, and draw it across the glass in one rapid stroke. As a rule, the cut, or rather the crack that follows the cut, is fairly deep, sometimes extending right through the glass for a part of the length of the cut. If the wheel is a good one the line will not be splintered, but an indifferent wheel, especially if it is a thick one, will produce a lot of fine splinters, which have to be gotten rid of if we are cutting dry plates for use in the camera. An indifferent diamond, or a good one badly used, will do the same, and the chips sometimes cause pinholes on the negative. As the wheel requires pressure, the glass should always be supported on a pad of paper laid on a level surface, to avoid breakages; the pressure with a diamond should, however, never be enough to break the glass, and so a soft surface is not necessary.

Selling Enlargements

A MARKED feature of the business done by professional photographers this year has been the great increase in the number of enlargements sold in good-class studios. For some years enlargements have been neglected by a good many photographers, largely because they have felt that the public associated enlargements with the cheap crayon productions at one time sold by agents.

That this feeling on the part of the public did exist cannot be gainsaid. Whether photographers did what was best for themselves in treating it as they have is another matter. Here and there, scattered about the country, are photographers who have kept on selling enlargements. These men have found that if they offer enlargements as good as their smaller work they can sell a number in the course of the year. They have proved that the public, which is willing to pay the price of a good photograph, is very frequently willing to pay the price of a good enlargement as well.

But it must be a *good* enlargement. The photographers who have made, and are making, a success of enlargements as a "side-line" are those who have realized that their customers can tell as readily as themselves the difference between the good and the bad. These people may not understand why one is better than the

other; they may not know anything about the methods of production; but they do know just as well as the photographer whether the total

effect is pleasing or not.

Enlargements up to 10×12 or 12×15 , especially when "solid" from dark-background negatives, may well be made in the photographer's own workrooms. But successful enlarging calls for a high standard of negative production. Pinholes, scratches and other development markings, as well as faulty retouching, all show up badly in an enlargement and require a great deal of work in finishing. And the quality as well as the quantity of the work done must be right. It sometimes happens that a photographer who is quite able to finish cabinet "sketches" attempts to finish a large head and shoulders enlargement. After some hours of laborious stippling the only result is that all flesh texture is lost, and very frequently the modeling of the features is so altered that the "likeness" is lost as well.

Unless the photographer is a really capable artist himself or has enough work to keep an artist going, it is much the best plan to have all enlargements which require much finishing made by one of the trade houses which make a special

feature of this class of work.

The enlargement which sells best nowadays is not the vignetted head and shoulders with a cloud background, which was sold ten or twelve years ago. Generally speaking, it may be said that the enlargement of today is an exact duplicate of the contact print in every respect but size.—Photo Digest.

A Useful Dry Plate Intensifier

The following intensifier for process negatives on dry plates will be found particularly useful, and on account of its being a single solution, far more practicable than the usual mercury bichloride, followed by a blackener of whatever composition.

A				
Bichloride of mercury			1	oz.
Water		 •	30	oz.
В				
Iodide of potash .			3	oz.
Water	. '		10	oz.
С				
Acetate of soda .			$2\frac{1}{2}$	oz.
Hyposulphate of soda			11/2	oz.
Water	. 1		20	oz.

Dissolve A, B and C separately, and add B to A until the red precipitate which is first formed is just redissolved. Do not add more of B solution than is necessary to accomplish this reaction, then add solution C. This makes a very strong intensifier, which should be diluted to half strength for use; the stock solution must be kept in the dark or it will lose its strength very rapidly.

It is particularly useful for evening-up halftone screen negatives that from one cause or another have areas of unequal density, or for local intensification of shadows; the solution being applied to the surface of the negative with a tuft of cotton-wool, the action can be watched and arrested at the right moment, and the surface effect being a gray discoloration, it is easy to observe its progress. The plate should be rinsed under the tap from time to time, and the result upon the dots examined with a magnifying glass, and continued or not as the case may demand. If it should be found that the intensification has been carried too far a little weak hypo solution will act as a reducer, so that it

will be seen that it is very elastic.

In principle I am opposed to the intensification of half-tone negatives on dry plates as a general practice, as it is possible to get all the density required by correct exposure and development only; but cases will arise, either through uneven lighting of difficult originals or faults in the originals themselves, where a certain amount of faking becomes a necessity. In such cases it is far more satisfactory to be able to use such an intensifier as this, because its action is positive and the full effect can be seen at once and not after a second operation, which frequently shows the intensification to be too strong or too weak, with very little chance of alteration. In tricolor work it is extremely useful in the hands of a careful operator, because of the ease with which it can be controlled.

For line negatives on dry plates it is also useful, but must not be carried too far or it will fill up the fine lines; but if this happens they can be cleared again with weak hypo solution, or in very bad cases a little ferricyanide of potash solution can be added to the hypo, when the

clearing action is stronger.

For very weak, continuous-tone negatives it is par excellence, and in extreme cases can be followed by the usual mercury and ammonia, thus obtaining a far greater degree of intensification than is possible by the double method alone, and it also has the advantage, when used alone, of picking up shadow details and producing less soot and whitewash effect than the two-solution method.

If the negative appears to become yellow during washing it can be disregarded, as it will dry out. In extreme cases it can be removed by a flow of weak hypo, which will not affect the general density unless the action is prolonged. With regard to permanence it is no worse than other mercurial intensifiers, and can be made much better by immersing the intensified negative in a clean-working dry plate developer for a minute or two; but as process negatives are not usually required to be kept for more than a few weeks this is unimportant. It also has the advantage of being less poisonous than the bichloride of mercury solution. Less washing is required after fixing when using this intensifier, as it is not necessary to totally eliminate the hypo, as is the case with the double process. The only trouble that need be feared is that if

there is too much hypo in the film it will act very slowly or not at all.

Finally it is the result of many experiments to find the best formula, and has been in constant use for at least fourteen years, so that I can recommend it with every confidence.—

Process Year Book.

Wasted Plates

During the last two years most photographers have sold all their discarded plates. Many of them have sold their negatives because they knew that a new negative would bring them more money than a re-order from an old one.

The number of plates which have been wasted during the past few years is enormous. We expect there will be a certain waste of plates, paper, etc., in every studio, but the waste is entirely too great. Every time a plate is wasted, before it is put into the discarded pile you should know why it has been discarded. If a proof has been made from the same and the proof returned without an order, it is up to you to find out why you did not receive an order from that particular proof. Whether it is because the position was not satisfactory, whether the negative was undertimed or over-timed, whether the dress was not arranged as it should be or whatever the trouble is, you should know it before that negative goes into the discarded pile.

We find it is a habit in most galleries to pick out the negatives from which pictures are ordered and the rest of the bunch go into the dump. This of course must be so, but before they go you should know why they have gone.

If you make four negatives of a child and you get orders for three you should know why the fourth was discarded. If you only get orders for one, you should know why the three were discarded.

It is not the cost of the plates, it is the time of making the exposures, developing the same, sending out the proofs, etc., which counts. There is sure to be some accidents, there is sure to be some mistakes but the same mistake should not occur repeatedly, and you should know why a certain negative was not ordered from so as to avoid this same mistake in the future.

With the increased price which must be paid for everything photographic it is necessary for the photographer to increase his price or increase his business. There is no better way to increase business than to have every negative so good that he will get orders from it. The customer may have only expected to order one dozen photographs, but when all of them are pleasing to him, it is easy enough to get an order for two and one-half to three dozen, which means a larger business and more profit.

Find out why proofs are rejected so as to overcome the same fault in the future.—Ohio Photo

News.

The Photographic Tournal

of America

Published Monthly With Illustrations

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THOMAS COKE WATKINS, Editor

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SOME RANDOM PAPERS ON PHOTOGRAPHY AND PHOTOGRAPHERS ABROAD THIS WIDE LAND OF OURS

I. WEBSTER OF OAKLAND

By SIGISMUND BLUMANN

THEN and where we were born which was in New York City, forty-five years ago—these United States were divided into three great parts—the East, the Middle, and the West. But we New Yorkers shared one arrogance with our Boston fellows: the East consisted of New York City and its suburbs, which comprised the rest of New York State, New Jersey, and Pennsylvania, and the rest of the country was West. New York City has since annexed for its suburbanites a great part of Connecticut and as far south as Florida. In our childhood days Chicago was West, Utah Far-West, and California Too Far-West. In 1906 San Francisco pulled off a rather large-sized catastrophe, with the help of Nature, and New York heard of that city as some-

thing outside the hazy scope of dreams. San Franciscans call Oakland a suburb, and a certain geography issued by the State Educational Board saw fit to omit it from the map. Now, as a matter of fact, Oakland covers territory equal to sixty and eight-tenths square miles, has over one hundred thousand residents, and is half an hour's travel nearer New York and the trenches in France than is San Francisco. In that its homes have gardens instead of cement areas, and its population takes to homes and roses rather than apartment houses; it is probably to be condemned as rural. Otherwise Oakland is quite a city! It supports three very metropolitan department stores, one of the highest-rated and accredited school departments in America, and is the abiding place of

several of the greatest of our national artists and writers, and, what brings us closer to the subject, supports as large a proportion of high-class photographers as New York, for instance. Perhaps with better tastes, developed of trees and flowers and homes of their own, the Oaklanders instinctively revolt at post-card portrait galleries, where your picture is taken and delivered while you



MR. F. A. WEBSTER.
THE WEBSTER STUDIO, OAKLAND, CAL.

wait. Personally, you could not tell an Oaklander from a San Franciscan or a New Yorker if you met him on Broadway. Perhaps no better evidence of Oakland being a real city need be offered than that so excellent a photographer as F. A. Webster is established here, remains contentedly established and prospers.

So, having become familiar with the city, and introduced by name to the man, we may visit the studio and consider the work.

But we love to diverge. Bypaths are ever charming. Let us consider how photographers come by their clientele. Bread is commonly bought of the nearest baker; your doctor you come by as a matter of urgent need and some chance;

you buy a piano on its name; but when you decide to have your picture taken you choose the gallery from which you have seen the sort of picture you fancy. You may have noticed the window display or a friend's portrait; but the thing itself is its advertisement. We will assume that you live in Oakland, or Berkeley, or Alameda, it amounts to about the same thing, and decide to go to Webster. You have had your "picture taken" before in a rich and varied lifetime, and hope the lady who meets you in the anteroom may not be too fine and grand; that her coiffure may not be depressingly elaborate and her manner too condescending; also, you know your own means best, and pray you may be permitted to order in the neighborhood of what you can afford, and not have to save your face by taking the twenty-five dollar style which "Everyone is getting," or resort to the transparent subterfuge of promising to call again.

The Webster elevator is very deliber-You carry your interior up with you, and have time to compose yourself after embarking and before arriving. You are there, and a pleasant-faced little lady meets you quite as if you had come to visit the family. This tribute is the pay of a grateful soul for courtesy, and loses none from being truth. You are permitted to tell what you think you want, and are shown anything you want to see. Your point of view is sympathetically taken into the transaction as a prime factor, and when you see the difference between what you had planned to get and what could be gotten for twice as much money as that might cost, you are convinced that the difference is worth it, and your own superior taste closes the bargain. That, if we agree in the estimate, is the high art of the true receptionist. We do not believe Mr. Webster hired this girl because she can retouch in spare time; in fact, we hope and think possible that there isn't much spare time. She makes friends and leaves you in the dressing room in a frame of mind that makes the subsequent admonition to "Look pleasant, please" unnecessary.

You are called and meet Mr. Webster.



BY F. A. WEBSTER THE WEBSTER STUDIO OAKLAND, CAL.



A quiet, soft-speaking man in a quiet, soft-speaking suit of clothes. He speaks your language and his habits are your habits. You can see he is a professional man, and that portrait photography is a liberal profession. The "gallery," or as it is sometimes formidably called "the operating room," is homelike and informal. There isn't even that awful skylight which so many consider essen-



BY THE WEBSTER STUDIO OAKLAND, CAL.

tial. Webster works simply for simple, straightforward results, and it seems to us he gets them. He is an idealist who has succeeded. This means patience, endurance, and the sacrifice of some profit. The general public enters the idealist's holy of holies with an up-to-date whirl, with pep and jazz if you will, and ruthlessly crashes the little fragile bisque gods to atoms. Glory to the fellow who has soul enough, time and time again, to gather up the fragments and patch them together! Worshipping still art and beauty till the careless become impressed or convinced and come with incense and offerings at last. Reads too eloquent for this practical age and subject. But many of you readers will get this in a

retrospective and introspective moment and will know what it means.

This is about the place to put some biography. We are not much interested in the subject's age; but it may help some to know he lived and practiced when tintypes were common and popular. In fact, he showed us how to flow a plate without getting a drop on the other side, how to get the liquid back into the bottles without spilling a drop, and some tricks of printing reminiscent of the days when a photographer knew all about his business, from coating the plate to making and printing the paper.



BY THE WEBSTER STUDIO OAKLAND, CAL.

In response to our inquiries, Mr. Webster tells us of himself:

"I was born a long time ago—1860—in Michigan, from parentage that dates back to Adam and in this country to 1630. At the age of fifteen I was put to work with an older brother making pictures. That is still my occupation. I have been continuously in Oakland twenty-nine years. Photographing in a legitimate way is a very peaceful occupation, and leaves very few incidents to relate.



BY F. A. WEBSTER THE WEBSTER STUDIO OAKLAND, CAL-





BY THE WEBSTER STUDIO

OAKLAND, CAL.

"The profession of photography is most beautiful and fascinating, but how it is abused by the cheap tricks

employed to get business!

"Probably I am out of date, but my idea of getting should be through the merit of what you have to offer and service, rather than luring your customers to your place through some trick and then going through them after you get them there. I believe that is the one thing that is keeping photography out of the honored and profitable position it should hold among the professions.

"For outings my chief pleasure is to get along the upper streams where the speckled beauties are, and I use the tackle and delicacy suitable for getting these beauties—the coarsest bait does not appeal to me—but then in a business way I may be wrong, since I am so far in the minority; besides the users of coarse bait don't eat it themselves."

Mr. Webster has retouchers, but loves to do his own retouching when he can steal time from the lunch hour or after business to do it. This love of doing and care of detail impressed us before in the case of Strauss, of St. Louis, who has devised a form of mounting as original as beautiful and makes recreation of producing the mounts with his own hands. It may not matter to the "customer" who made the card or retouched the negative, but be assured, though an employee might do it almost as well, some element of sentiment should be missed and the whole suffer by that much.

Were we gifted with the analytic faculty and erudition of a certain eminent critic this were the opportunity to show our attainments; but the pictures are before you, and professionals certainly, and laymen probably, can make better deductions than we can offer. We do not know whether others have ever felt so, we have frequently felt that the personality of the artist is in his work, in photography as in the other arts; that it shows like thought through the eyes. And to us the contemplative, gentle temperament of Mr. Webster characterizes his work.



BY F. A. WEBSTER THE WEBSTER STUDIO OAKLAND, CAL-



SOME MINOR PROCESSES OF PHOTOGRAPHY'

PART II

By C. H. BOTHAMLEY, M.Sc., F.I.C.

Chromium Intensifier

N this process, which was worked out in detail, though not actually invented, by C. Welborne Piper and the late D. J. Carnegie (Amat. Phot., 1904, pp. 336 and 397, and 1905, pp. 453, 473), the negative is treated with a solution of potassium bichromate acidified with hydrochloric acid, and the bleached image, after washing, is treated with an ordinary developer. According to Piper and Carnegie, the bleached image contains a chromium compound, which they suggest may be the so-called chromium dioxide, CrO₂, generally regarded as chromic chromate, Cr_3O_6 . They established the presence of chromium, but not the precise nature of the chromium compound.

I made experiments in order to get some information as to the exact mode of action of this intensifier. A solution of pure chromic acid alone, 2 parts in 100. acts readily on negative and positive images, and in time will completely remove the silver from even a dense negative if a sufficient volume of the solution is used. (Specimen shown.)

A solution containing only 5 parts of chromic acid in 1000 parts of water also has a distinct, though slow, reducing action. The silver is dissolved as silver chromate, while part of the chromic acid is reduced to the condition of a chromic salt; the image that remains consists of

unaltered silver.

A 5 per cent. solution of very carefully purified potassium bichromate, free from chlorides and free from chromic acid, has no action, even after forty-eight hours' immersion, on a negative which has been washed free from chlorides. results were obtained with lantern slides, notwithstanding the finer grain of the silver.

¹ Twentieth Traill-Taylor Lecture delivered before the Royal Photographic Society.

Further, a solution containing pure potassium bichromate (5 in 100) and pure salt, but no free chromic acid, also has no recognizable action on the silver image.

It follows that the bleaching effect is due to the simultaneous action of chromic acid and potassium chloride, formed by the action of the hydrochloric acid on the potassium bichromate.

I find, in fact, that a solution containing pure chromic acid and pure salt readily bleaches silver images, with results not distinguishable from those obtained with a solution of bichromate

mixed with hydrochloric acid.

I also made some experiments concerning the composition of the bleached image. It clearly does not consist of pure silver chloride, because it has a pronounced brown color, much more distinct with formula A than with formula C (see below). There is, in fact, no difficulty in detecting the presence of chromium, by the ordinary tests, in both the bleached and the redeveloped image, though the proportion seems to be smaller in the latter.

Further, if the bleached and thoroughly washed image is carefully treated with a dilute solution of caustic potash, potassium chromate passes into the liquid and gives it a yellow color. now the negative is again well washed the image is still found to contain chromium, but only in the basic chromic condition. It follows that the brown constituent of the bleached image is a chromic chromate. When the bleached image is treated with a developer this chromic chromate is reduced, and part at least of the chromium remains in the chromic condition in the image, mixed with metallic silver. The amount of chromium so left is very small when the C formula is used.

The three working formulæ recommended by Piper and Carnegie are:

(254)

Potassium bichromate		B 10 gr. 5 min. 1 oz.	C 10 gr. 20 min. 1 oz.
Or approximately—			
Potassium bichromate	10 parts 2 parts 1000 parts	20 parts 10 parts 1000 parts	20 parts 40 parts 1000 parts

They stated that formula A gives a high degree of intensification, and formula C a low degree, while formula B gives an intermediate result. The strip negatives shown on the screen confirm these statements. The degree of intensification obtained with B is nearer to that obtained with A than to that obtained with C. The result is determined by the relative proportions of acid and bichromate and the proportion of acid is the dominant factor. In order to obtain concordant results with certainty, it is of great importance to make up the formula with more than usual care and accuracy. It is unfortunate, therefore, that the formulæ as commonly published specify the use of concentrated hydrochloric acid, which is not easily measured accurately with the means usually at a photographer's disposal, especially when quite a small quantity is required, as with formula A. It is a much better plan to dilute the strong acid by adding 9 equal parts of water and then measure out ten times the volume of dilute acid, so that the formulæ would read:

	Α	В	С
	parts	parts	parts
Potas. bichrom.	10	20	20
Hydro. acid, dil. (1 in 10)	20	100	400
Water up to	1000	1000	1000

Piper and Carnegie recommended amidol as the developer to be used after bleaching with the bichromate and washing. In my experiments, when formula A is used, the degree of intensification is the same, whether re-development is effected with amidol or diamidophenol, or with metol-hydroquinone, but with formula C the results indicate a slightly lower degree of intensification when metol-hydroquinone is used.

With formula A the intensification is due in a substantial degree to the chromium compound which has been added

to the image; with formula C the intensification is mainly due to an increase in the size and light-stopping power of the silver granules, due to their conversion into chloride and subsequent redevelopment (see W. T. P. Cunningham in *Phot. Jour.*, 1906, lvi, p. 2).

Experiments were made with mixtures of chromic acid and purified common salt, the bleached image being afterward redeveloped with diamidophenol and sulphite. The chromic acid and salt are easily weighed out accurately, and separate stock solutions, 1 in 10, can be kept unchanged for any length of time. If the image is bleached with

Chromic acid	٠.		4 parts
Salt (sodium chloride)			4 parts
Water		up to	1000 parts

and redeveloped, the result is practically identical with that given by Piper and Carnegie's formula A.

Some experiments were tried as to the influence of the relative proportions of acid and salt:

	D	Ł	F
Chromic acid	$2\frac{1}{2}$	5	$2\frac{1}{2}$
Salt (sodium chloride .	$2\frac{1}{2}$	$2\frac{1}{2}$	5
Water up to	1000	1000	1000

The intensification with D and F is identical, and is a little higher than with the stronger solutions given above, but the intensification obtained with E is distinctly lower than with D and F. Sections of the same strip negative were treated with the different solutions, and the measurements were made with a Sanger Shepherd densitometer.

Densities

D		4.7	7.0	9.0	12.5	15.3	17.3
Ε		4.0	6.0	7.7	10.5	13.5	15.7
F		4.5	7.0	9.0	12.5	15.5	17.5

The chromium process is of great practical value, as many have already recognized; it is easy to work, and if care is taken in making up the bichromate and acid solution it gives concordant Moreover, it is applicable to results. negatives, lantern slides, and bromide or gaslight prints. Formula C not only gives that slight degree of intensification which a print often needs, but may also greatly improve the color of the image. With a still larger proportion of acid there is still less intensification, but at the same time a distinct improvement of color, if, for example, the original image has had the well-known olive-green tint.

Intensifying and Toning with Ferricyanides

The uranium and ferricyanide method of intensifying negatives and toning prints and lantern slides is well known. Solutions of uranium nitrate (2 in 100) and potassium ferricyanide (2 in 100) are mixed in equal volumes and acidified with acetic acid. The mixture is poured over the carefully fixed and washed negative or positive and brown-red ferrocyanide is gradually deposited on the image, the silver being converted more or less completely into silver ferrocyanide. The chief practical drawback to the process as thus carried out is the tendency for the brown-red compound to deposit on the whites of the print or the shadows of the negative instead of on the image alone, a fact which, together with doubts as to the permanence of the brown-red image, has led to the disuse of the process. result is unfortunate, because if the process can be carried out without staining the shadows of the negatives, it has great value as a method of intensification especially with very thin negatives, as Eder pointed out emphatically long ago. Similarly, if staining of the whites can be avoided, the process provides a simple means of imparting to bromide prints and lantern slides a color which is well suited to certain subjects, but is not readily obtained in any other way. Further, the ferricyanide process is capable of numerous modifications which yield a variety of colors suited to special purposes. (Namias, "Ueber die Tonung mit Ferrocyanverbindungen zur Erlangung von Bildern in verschiedenen Tönen auf Bromsilberpapieren und von Diapositiven," Eder's *Jahrbuch*, 1908.)

Sixteen years ago, however, L. Bune pointed a way out of the difficulty (Bull. de l'Assn., Belge., 1901, 627-629). He recommended carrying out the process in two successive operations, instead of with mixed solutions. The wellwashed print is immersed in a solution of potassium ferricyanide (2 to 5 in 100) until bleached, and is then well washed. The bleached image is not affected by uranium nitrate solution, but if immersed in uranium chloride solution (1 in 100), or in a solution containing uranium nitrate 1, common salt 20, water 100, the image gradually changes to warm sepia, the whites remaining unstained. The modified process was described as applicable to the toning of positive images, and it was not suggested that the same method should be followed when intensifying negatives. It is remarkable, however, that this valuable suggestion would seem to have been entirely neglected, although I called attention to it at the meeting of the Photographic Convention in 1906.

1905 L. J. Bunel (Bull. Soc. Franc., 2, xix, 303) (a comparison of this paper with that just referred to suggests that there is some mistake in the names, and L. Bune and L. J. Bunel may be one and the same person), advocated the use of citric acid (2.5 in 100) or oxalic acid (1.5 in 100) in place of acetic acid, on the ground that they prevent deposit elsewhere than on the image. He attributed the general staining to the formation of an unstable uranium ferricyanide, and stated that if a considerable quantity of salt is dissolved with the uranium nitrate, or if uranium chloride is used instead of the nitrate, the formation of unstable ferricyanide is prevented and staining is avoided. The paper also refers to the method of toning positives in two stages. (See above.)

Before dealing with the process itself, it is advisable to clear up one or two points concerning the chemical reactions

involved. It is well known that when a solution of a silver salt is slowly added to a mixture of salts, with the acid radicles of which it forms insoluble salts (precipitates), the silver may combine preferentially with one of the radicles before combining with the others. If the liquid contains iodides, bromides, and chlorides, for example, the precipitate at first consists of silver iodide alone, later of silver bromide, and lastly of silver chloride. Similarly, if silver chloride is treated with an alkali bromide, it is converted into silver bromide, and if silver bromide is treated with an alkali iodide, it is converted into silver iodide. It has lately been stated that silver chloride is converted into silver ferrocyanide when treated with potassium ferrocyanide solution, whereas silver bromide and silver iodide remain unaltered when treated in the same way, and these facts have been utilized in a method for detecting chlorides in a mixture of chlorides, bromides, and iodides.

I have verified these statements, using carefully purified potassium ferrocyanide.

The position of the ferricyanides in this series has to be considered. adding a solution of a silver salt to solutions containing (a) ferrocyanide and ferricyanide, (b) ferricyanide and chloride, and by treating (c) silver ferricyanide with a solution of a ferrocyanide, (d) silver ferrocyanide with a solution of a chloride, (e) silver chloride with a solution of a ferricyanide, and (f) silver ferrocvanide with a solution of a ferricyanide, it is easy to show that—

1. Silver forms the ferrocvanide in

preference to the ferricyanide.

2. Silver forms the chloride in pre-

ference to the ferricyanide.

Combining now the known results, we get the following order of preferential formation of silver compounds:

Sulphide, iodide, bromide.

cyanide, chloride, ferricyanide.

That is to say, silver will form silver sulphide in preference to any of the others; iodide in preference to any of those following it; and so it will form any of the other compounds in preference to forming ferricyanide. The practical application of these facts will become clearer later on.

Returning now to the uranium process, it seemed worth while to ascertain how far the precipitation of uranium ferrocyanide which causes the staining (a) depends on the uranium salt used; (b)

is affected by light.

Using very pure samples of uranium salts and of potassium ferricyanide, I found that if the solutions are mixed in the dark and kept in the dark, there is still some precipitation of uranium ferrocyanide, which is not prevented by addition of acetic acid. Exposure to diffused daylight distinctly increases the amount of precipitate formed. There is no distinct difference in behavior between uranium nitrate, chloride, and acetate.

Potassium ferricyanide quite free from chloride ferrocvanide and bleaches a negative image which has been washed free of soluble chlorides. With a solution of 5 parts in 100 the action is fairly rapid. The bleached image consists of silver ferrocyanide, with possibly some silver-potassium ferrocyanide. I could obtain no evidence that the image contains any ferri-

cvanide, as Bunel suggested.

If, now, the bleached and well-washed negative is immersed in a solution of uranium nitrate or acetate free from chloride, there is no change, but if immersed in a solution of uranium chloride, or a solution of the nitrate or acetate to which a fairly large proportion of sodium chloride has been added, the white image gradually changes to brown. as Bunel stated, and there is no staining of the shadows of the negatives or the whites of the print, as the case may be. The action of the uranium solution is somewhat slow.

I find that the action is much more rapid and the color of the image is brighter and redder if the solution of uranium nitrate is mixed with potassium bromide, instead of with a chloride, but great care must be used to avoid adding any excess of bromide, because while a moderate excess of chloride does no harm, since it does not decompose the silver ferrocyanide which forms the image (see above), an excess of bromide may spoil the result, since the bromide will then change some of the silver ferrocyanide into silver bromide before the uranium salt has time to act on it. If both compounds are quite pure and dry 100 parts of uranium nitrate require 47.4 parts of potassium bromide, but it is advisable to use a lower proportion. Useful solutions are:

Α

Potassium Water			5 parts or 100 parts or	
water .	 	•	100 parts or	10 02.
	Ţ	2		

Uranium nitrate . . . 5 parts or 350 gr.
Potassium bromide . . 2 parts or 140 gr.
Water 100 parts or 16 oz.

If the purity of the uranium nitrate is doubtful it is wiser to use only $1\frac{1}{2}$ parts (or 100 grains) of potassium bromide.

The thoroughly fixed and washed negative, print, or lantern slide is immersed in A until bleached. It is then thoroughly washed—a matter of great importance—and immersed in B until no further change takes place. The intensified or toned image is washed in several changes of water, *slightly* acidified with acetic acid if the water is hard, and finally in three or four changes of water as soft as is procurable.

(The specimens exhibited not only showed absence of staining of the film or paper, but also illustrated the great intensification of negatives obtainable

by this method.)

If the intensifying or toning is unsatisfactory, treatment with an alkaline developer will restore the silver image, and the process can be repeated from the

beginning.

The ferricyanide and uranium solutions can be used more than once, but the ferricyanide solution must be kept in the dark as much as possible. It is, of course desirable to use ferricyanide as pure as possible, but an additional advantage of the method of successive treatments is that if the negative or print is well washed between bleaching and treatment with the uranium solution, a small quantity of ferrocyanide in the ferricyanide does no harm, whereas in the mixed solution method it would increase the general staining.

It should be observed that the com-

position of the final image is not the same in the two methods of working. Namias pointed out (loc. cit.) that when the silver image is treated with the mixed solution of potassium ferricyanide and uranium nitrate, the final image consists of uranium ferrocyanide mixed with silver ferrocyanide, and with more or less unaltered silver if the action has not been prolonged. On the other hand, when successive treatment with ferricvanide and uranium chloride separately (or nitrate mixed with sodium chloride) is adopted the final image consists of uranium ferrocyanide mixed with silver Namias recommended the removal of the silver salt as conducive to the permanence of the image, and suggested for this purpose the use of a 10 per cent. fixing bath containing as much boric acid as it will dissolve. L. Lemaire (Phot. Corr., 1905) had previously suggested the removal of silver ferrocyanide (when the mixed solution has been used) by immersing the plate in dilute nitric acid.

It may be added that when the mixed solution method is used, the substitution of uranium acetate for the nitrate does not affect the composition of the resulting image, but if uranium chloride is used, some silver chloride will be formed in the same way as when the potassium ferricyanide and uranium chloride are applied separately.

When uranium bromide (or uranium nitrate and potassium bromide) is used after bleaching with ferricyanide, the resulting image consists of uranium ferrocyanide and silver bromide.

The silver salts can be removed by treatment with a 10 per cent. fixing bath to which some sodium sulphite and potassium metabisulphite have been added, but the image before fixing must be considerably stronger than the final image is desired to be.

Prussian Blue Toning

The method of separate solutions can be adopted for toning prints or lantern slides to a blue color, and the same freedom from general stain is thus ensured. The print or slide is bleached in the ferricyanide solution, well washed and immersed in a solution of ferric chloride (iron perchloride) containing 2 to 5 parts in 100 until the color change is complete. The first washings should be done with water slightly acidified with acetic or oxalic acie. The blue image is a mixture of ferric ferrocyanide with silver chloride.

Ferrocyanide Toning without Using Ferricyanide

It is not really necessary to use ferricyanide at all if advantage is taken of the fact that silver chloride is converted into silver ferrocyanide by treatment with potassium ferrocyanide. Three processes are involved, it is true, instead of two, but the expensive and somewhat unstable ferricyanide becomes unnecessary.

The silver image, negative or positive,

is first changed into silver chloride by treatment with any bleaching solution which will convert it into silver chloride alone, unmixed with any other compound. Nothing is simpler or quicker than a dilute solution of potassium permanganate containing some hydrochloric acid. When bleaching is complete, the permanganate is washed away, and any brown stain is removed by immersing in a dilute solution of potassium metabisulphite or a dilute solution of sodium sulphite acidified with sulphuric acid. The plate or print is then well washed and placed for not less than five minutes in a solution of potassium ferrocyanide, 5 in 100. After again washing, the bleached image is ready to be treated with uranium bromide (as above) for red-brown tones, or with ferric chloride for blue tones, the composition of the final images being the same as when ferricyanide is used in the first stage.

FINISHING PHOTOGRAPHS BY THE AIR-BRUSH

By ARTHUR WHITING

THE introduction of the air-brush has revolutionized the finishing department of many photographers, not merely because of its easy manipulation and the soft effects which it is possible to obtain with its aid, but also because, when properly done, the work itself does not show on the surface, when viewed in a contrary light to that in which it was accomplished, which is invariably the case when air-brush methods have been used, unless the picture has a glossy surface and has been finished with equally glossy pig-Nor is the surface so easily damaged as when stump work has been employed, a matter of much importance if the picture is not to be framed immediately. The original air-brush was shaped something like a spectacle case, and was much more uncomfortable to use than the present style form of brush. The various makes are similar, and

consist of a color chamber and outlet, and an air inlet and outlet, all regulated by a trigger, which is worked by the first finger of the operator, and either by a downward or a backward pressure, or both, air and color are discharged respectively. The current of air meeting the color at the tip of the brush, carries the latter along with it in the form of a fine spray, and this can be deposited upon the surface of a photograph and utilized for giving it a finished appearance.

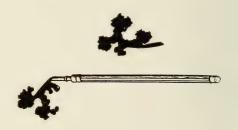
How to Prepare for the Work

The enlargement, whether upon rough or smooth surface paper or porcelain, should need no preparation, except that paper ones should be mounted, and preferably with paste, as not infrequently when dry-mounted the picture will leave its support owing to the stretching

of the paper; while, at the same time, the dry-mounting tissue refuses to stretch. When this happens, the work can be usually finished, and then when quite dry again the picture can be placed in the mounting press for a second time and made secure. If, however, the picture has been handled with the fingers carelessly, it often happens that the color refuses to deposit in parts, and so the appearance given is of a smudgy nature. Methylated spirit is, therefore, sometimes employed upon a tuft of cotton-wool, but this also is apt in some cases to act in a similar way to finger marks. Probably the best method is to apply pumice powder upon cottonwool, rubbing more especially around the margins, then to remove all trace of it completely with a clean duster, and afterward to wipe over with a damp chamois leather. Then, if all markings have been removed, the surface will present a uniformly damped appearance, without streaks and oily marks. In any case it is absolutely essential to remove all trace of both pumice and fluff, for either will act as resting places for the subsequent color spray and give an unpleasant and irregular finish.

For finishing in black and white you will prepare either a solution of lamp black, ivory black, or a mixture of india ink and Payne's gray, or indigo blue. The special lamp black prepared by air-brush makers will do nicely, or the artist's colors prepared by well-known The cheaper "student's" colors are often gritty and liable to choke the brush or to cause it to spurt. If you are obliged to use inferior colors, filter the solution prepared from them through a piece of old cambric, which has first had a little plain water passed through it. See that the water used for your color solutions is free from grit and dust. Also use the precaution of working in a dustless room, for attention to these details means the abolition of half the worries and misfortune attendant upon this class of finishing. We cannot expect a delicate instrument like an air-brush to work well if clogged with grit and dust. If you are going to use the air-brush daily or have a lot of finishing to do, it is well to make up three different solutions of

the same color, but of various, though definite, strengths. Put these into vials, cork with rubber, or washed or waxed corks (to free them from cork powder), and label "Strong," "Medium," and "Weak." For the rapid insertion of cloud effects it is useful to cut out a cloud-like edge on a piece of thin cardboard or celluloid, but a more advisable method is to prepare two or three such templets out of a sheet of very thin copper, zinc, or brass, with a little piece turned up at an angle of about 30 degrees which is inserted in an ordinary retouching pencil holder. This latter acts as handle and enables the worker to hold the templet at a more convenient angle for working. (See figure.)



Another great convenience is to have some means of holding the air-brush securely, when it is necessary to have both hands free for a moment. brush makers supply a clip for the purpose, but a large-sized ordinary screw eve obtainable at any ironmongers is a ready and more satisfactory airbrush holder. It merely needs to be screwed on to the left edge of the drawing board, and its angle of inclination can be readily altered as circumstances demand. You will naturally work against a drawing board of some sort. If finishing an enlargement, this is best placed on an easel, but for finishing small work, the board can be placed (at a slight angle) on a table. The light should fall upon the subject from behind and to the left, while the working hand of the operator may be steadied by a mahl stick, held in the opposite hand; or for work upon a table, a sheet of clean paper is sufficient. Have to hand some clean water, sable brushes, color ground on a palette, a duster, some cotton-wool, a piece of fluffless blotting paper, and also a piece

of stout white paper (rounded at, at least, one corner), to test the color discharge from time to time. The rounded corner enables us to test the strength of the spray upon the paper and then immediately to transfer it to the desired part of the picture, with greater ease than if working off a straight line.

How to Use the Air-brush

The air pressure required to work a air-brush successfully differs with the different makes, and depends on the density of the color medium and the size of the expanse over which it is desired to deposit the color. When the pressure is too high it is much more difficult to control the density of the color discharge, but when too low the spray ejected is coarse and more scattered, not over a greater surface, but over a lesser, only much more isolated. Roughly speaking, if one is working with a satisfactory model an air pressure from 5 lbs. all the way up to 30 lbs. may be used, the best average being 15 lbs. Lines, details, and fine work require a low pressure, i.e., 5 lbs. It is impossible to make lines or finish detail with a heavy pressure, because the finer the work required to be done the nearer the brush must be held to the picture in order to limit the spread of color emanating from the brush. And as the spread is limited the spray is naturally more collected and intense, so that a high pressure of air blows it to either side of the place where it is first deposited in numerous angular lines. But if the color solution is in itself dense, containing a great amount of pigment, a higher pressure than that given above may be necessary, as naturally a greater power is required to atomize it and carry it from the brush.

Before commencing work see the brush is in working condition by passing a little plain water through it first. If the working parts act stiffly they may need cleaning or oiling, and it will save time and temper to attend to these details first. Also, by way of digression, do not omit to clean the brush by passing water through it immediately after its work is finished for the time being. This is an essential rule of practice with all makes

except the fountain form of brush, and even then it is the desirable way.

As to the order in which the different parts of a picture should be attended to. and what should be done with the airbrush, and what with the hand, it is not easy to decide here, because not only do artists work differently, but also one picture is best done in one way and another picture in a reverse way. But almost all (enlargements) need a fair amount of spotting, and, if from portraits, usually need the pencil marks of the retouching to be softened down; and in the writer's experience the majority of work is most quickly and satisfactorily executed with hard lead pencil. The airbrush is useless for this part of the job. If you therefore intend to use lead pencil work this must be done before airbrushing, but for brush work it matters little whether it is done before or after. although, as there is no chance of there being a deposit of pigment worked up under the brush it is perhaps also best to do this before air-brushing. For the pencil work use a five "H" pencil for the whitest parts and down to a one "H" for the parts about half-tone. Use the pencil just as you would when retouching. Besides spotting you may strengthen any fine detail in the lights and halftones, and when you have guite finished pencilling just spray over it with plain water, using the air-brush and a fairly high pressure. When the surface is dry it will be found that not only is the pencilling fixed, but also that the shine of the pencil has (on most makes of paper) quite disappeared. You can now spot or retouch the deeper and shadow parts of the picture with the requisite size sable brush and water-color, using a No. 2 for small work and a No. 3 or 4 for larger pictures. The remarks concerning the use of lead pencil work refers only to black and white pictures; for other tones the sable brush and color will alone be employed. Also it must be noticeable that it is not advisable to pencil the deeper or shadow parts, as not only is it difficult to obtain the required depth of tone even with very soft pencils, but also the shining of the surface is troublesome, and not entirely overcome by air-brushing with water.

Before commencing with the air-brush work proper it may be desirable to sharpen or insert detail here and there, as in parts of the hair, features, dress, ornaments, etc., or in landscapes, the masonry (in parts only) and other portions, with the aid of the sable brush, because the sharp edges of air-brushed patches of color are not so well defined as it is possible to make them by the older method. Having attended to all these things, we can commence the airbrush work proper, and for preference may apply ourselves to the shadow portions first. Where these need strengthening we shall spray upon them the deeper or stronger shade of our color solutions. In doing this it will be necessary to confine our sphere of action, so that we do not apply an unwanted tint of color over the immediately surrounding parts which may be required to be of a lighter shade. If the part being finished is very limited in extent we may do this easily enough by using a low air pressure, holding the brush close to the part (e. g., a $\frac{1}{4}$ or $\frac{1}{2}$ in.), and allowing a minimum of color only to escape, at the same time quickly moving the instrument over the portions to be strengthened. For the novice must understand that in using the air-brush the hand must never be stationary while the color is discharging, not even for the fraction of a second, otherwise tears of color, blots and blurs will be produced. And the more limited the area to be colored (and also the denser the color pigment) the quicker must the motion of the instrument be. Not only so, but it is not desirable to travel at once over the same ground with the color outlet open, as when the surface is still damp the color is much more liable to coalesce and afterward form tears. And this would sometimes mean that it would be necessary to remove the work altogether and begin again. If when working the reader finds that the surface has suddenly become wet, cease working on that part immediately; it may dry up satisfactorily if left alone, or need very little touching up with brush or pencil. If the latter, follow with water spray to remove shine of pencil.

But suppose we are desirous of apply-

ing a dense spray of color, having a sharp edge, and spread over a rather large surface, we shall find it somewhat difficult to give an even deposit unless we have recourse to some means to prevent the spray overlapping the edges of the part where it is desired to be. For, as the surface now to be covered is greater, the distance the brush must be held from the picture is greater also, as the color spray is projected from a point and spreads out comet-like; and so, to get at one sweep the fullest benefit of this 'spread," we must hold the instrument at an increased distance from the surface on which the color is to be deposited. Therefore, to protect the surrounding parts we can cut an exact templet out of a piece of transparent paper (you must not use waxed paper). Fasten, or hold rigidly, a piece of paper in some way over the photograph, and accurately trace out the outlines of the parts in the picture to be protected, using a rather soft (but fine-pointed) pencil to obviate making surface indentations. remove the paper and cut away with a sharp knife or pair of scissors as necessary, and replace the paper, secured in any convenient manner, and proceed carefully with the spraying. I say "carefully" advisedly, because as the templet is in contact with the picture, any superfluity of dampness may cause smudges, and if work is placed on the part too deeply the result may be unsightly, although this can often be hidden by a little judicious brush and knife work later on. This method of working I have found especially useful when, in the higher-class work, it has been necessary decidedly to increase the strength of drapery situated next to a white collar, or in darkening an abnormally light background immediately next to the features. In working over the shadows, or, in fact, any other part, you will be constantly moving the brush when the spray is being thrown, holding it away from one to six inches for the broader effects and giving greater liberty to the color outlet the further you are holding the instrument away. As you desire to concentrate your color on more limited and defined areas, bring the brush nearer, shut off the color valve in proportion as you come nearer, and ever move the instrument and always and only over those parts where you desire the deposit to be thrown. Unless you have a fixed air pressure, or, rather, one that can remain fixed, you must keep an eye on the air gauge, for if it drops too low, and especially if the color outlet is full on, the brush may "spit," and thus deposit some unsightly blotches on the picture. Much broad detail can either be put in or strengthened with the airbrush, either in the shadows or elsewhere, the folds of draperies brought out, tresses of hair straightened up and beautified, etc.; and in all such cases the color valve must only be partly on, the motion swift, and the air pressure medium to low. For finishing the halftones a weaker solution, "medium," should be used, for in most cases you can let it be sprayed a little over the shadows without materially affecting them.

Finishing the Background

Most portrait enlargements lend themselves to some nice finishing with airbrush work over their backgrounds; and landscape enlargements, too, on account of the possibility of making beautiful clouded skies, are remarkably enhanced by the same method. If, in portrait studies, the background is white, as when it has been painted out in the negative, or is very light, it will be best to cut out a templet from transparent paper to fit over the face and neck or other adjacent light parts, and possibly also over the hair. By this means you can safely spray the background right up to the features, etc., without fear of the color being deposited on them. If, however, the background is of a medium or darker tone this is usually unnecessary. Here it will suffice to use a piece of paper in the left hand, preferably with one or two rounded corners, as already described, and when working close up to lighter parts which must not be soiled hold the paper over them, about an inch or so away, open the color valve gently, while the nozzle is placed so that the spray will fall upon the paper, and work off this on to the picture, moving repeatedly the paper in harmony with the movements of the brush and constantly using it as a shelter to the part to be protected from the spray.

In order to get cloud effects in portrait backgrounds the instrument is rapidly moved about in a manner so as to give the shadow parts of the clouds. requires a certain amount of skill and dexterity in handling, since the movement must be quickly made, and also the brush must be held at increasing and decreasing distances the while, the finger on the trigger manipulating the color and air valve in corresponding values to the position of the brush from the paper all the time. To make the little sudden breaks of light and shadow usually produced in this class of work use a piece of paper or cardboard or the little tools previously described; cut out neatly in any form desired. It is well to have various sizes and shapes at hand suitable both for enlargements and the hand finishing of smaller photographs. If you take one of these templets and spray over and around it while you hold it still vou will have an unsightly patch as the result, unless a very fine deposit of color has been discharged, and then it may not be noticeable. To use these templets successfully it is necessary to hold them from a quarter of an inch to one or two inches away, according to the work in hand, and while carefully spraying over and around them to keep them in motion too, although sometimes still for the fraction of a second. This motion is sometimes semi-rotary, sometimes horizontal, or vertical, sometimes oblique to the surface of the picture. By an appreciation of what good cloud effects are, a knowledge of their lights and shades, and deftness of manipulation, you will succeed. Sometimes, inadvertently, a tear of color will form, when, if it is likely to mark badly, a point of the fluffless piece of blotting paper is lightly applied to absorb it, and as most blotting papers will absorb at their edges more readily if slightly damp, it is wisest to take this tip also and moisten with the lips before applying. Of course, the paper is not laid on the part, only the tip of a corner of it should be used.

A few words as to the balancing of

light and shade, for it often happens that the artist can help to bring out a part by an adjacent shadow, or subdue it by an adjacent similar tone. Generally speaking, you must be careful not to make the background of a corresponding tone to the portions of the features in immediate proximity thereto. Also while the medium strength of solution is being used it is advisable to tone down any portions of the hair, draperies, or accessories which may be unduly light.

Air-brushing the Features

These are best finished with a weaker solution of color, although, of course, there are exceptions. A single misspray of color here may ruin the whole picture. It is particularly essential to see the air-brush is working perfectly, as when it is necessary to emit only a very fine stream of color it will sometimes do this for a second or so after the color valve is open, and then stop, to recommence spraying a few seconds later. As the color value being used is a light one it is difficult to detect this, and, of course, it is easy to see that it would be ruinous in finishing a likeness. Have the piece of paper in the left hand both to test the color spray constantly and to shield the picture, and then bring the rounded corner opposite to the deepest part of the tone to be strengthened, and then with the spray turned on to the paper ever so lightly, using a low air pressure, work off the edge of the paper on to the picture, sweeping the brush (held as close to the work as necessary, according to the size of the part to be covered) over the desired portion, and immediately over the paper again. The speed of the "sweep" is to be varied, according to the depth of the increase desired, being quicker over the parts to

be kept lighter and slower over those to be made relatively more dense. Also the narrower the modelling required the closer the instrument is to be, down to, say, one-eighth of an inch away. As to where to put this modelling, the ordinary knowledge acquired in learning the retouching of negatives will be available here, if the fact that one is working on a positive instead of a negative is borne in mind.

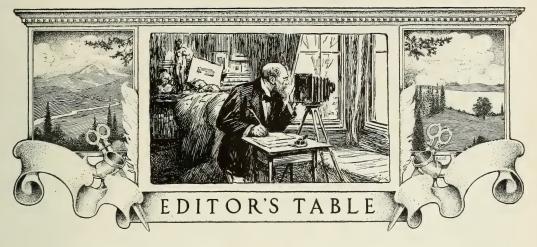
Finishing with the Knife

Almost all the better class work should be finished with the knife, the ordinary retoucher's scapel being an ideal tool for the purpose. If the original negative has not been properly spotted, or if the enlargement is from a "copy," black marks and dots are to be seen in the picture, and the knife is the best instrument to remove them. Many persons perhaps delete these at the commencement of the work, but my practice is to leave them alone until the last, because most of them are air-brushed over, and it usually happens that not only do they show less intensely then, but also it often is the case that the mere removal of the air-brush work with the knife effaces them, without having to damage the gelatin film—a fact of great value.

At this stage too we shall also do any knife work proper, as the removal of portions of the image, for in the same way the required amount of work is lessened at this stage. After this knifing has been done some spotting will be required, but it is best not to use the air brush if it is possible to avoid it, as it usually is. The lights of the eyes, nose, lips, etc., can now be attended to with the knife, and any little specks from the spurts of the air-brush removed.—British Journal of Photography.

WATCH YOURSELF GO BY

Just stand aside and watch yourself go by:
Think of yourself as "he" instead of "I."
Pick flaws; find fault; forget the man is you
And strive to make your estimate ring true.
The faults of others then will dwarf and shrink,
Love's chain grows stronger by one mighty link.
When you with "he" as substitute for "I"
Have stood aside and watched yourself go by.
—Exchange.



ARE YOU SATISFIED?

WHY do so many photographers remain content to do a small business in a small town for a small profit for so many years? Too many of them are quite satisfied with their work. They know all about photogaphy, and if they are not getting as good a living out of it as they ought, they can point to some outside reason for this failure. The people don't appreciate their style of work; too much competition, or, perhaps, they will tell you that they are too near a large city—people always go to large cities when they can.

The photographer who knows it all, and is satisfied, does not stop to ask why the people who live near a large city prefer to go there to have their photographs made, instead of going to him. He does not realize that they go past him to get better work. Then, when opportunity offers, and he attends a demonstration by one of the big city men, he is sure that while it was a good demonstration it did not quite fit his case, and goes home thinking little more about

The same thing happens after he has seen the manufacturers' display of new time- and labor-saving devices. They are very good and very clever, but there are always reasons why he cannot adopt any of them. He fails to observe that the biggest men in the profession are much interested and are placing their orders for anything new that promises

to save time or money. They do not spend their money for the love of spending, but with a desire to have the latest and best.

Do they ever stop to consider that if the most prominent and successful photographers do certain things in a certain way, it is a way that has brought them to their high standing, and must necessarily be the best way of doing those things?

It is the same with the magazines. The photographer who knows it all, and is satisfied, does not have to bother with them. He'll tell you that he has tried them, but never found one that was any help to him. He is so sure that he is doing everything just right that the idea of trying any other method but the one he knows does not appeal to him, and so he does not read the magazines.

If the photographer who attended a convention would remember what he saw there, and made an effort to thoroughly try out some of the newer methods, he might possibly find that the new method was better than his old one, and that there were some things in photography that he had never dreamed If he makes a close study of the methods of the successful men in the profession, by either seeing their demonstration at a convention, or by reading about them in the magazines, he cannot fail to improve his own methods and make better work for better prices which is the chief end of the photographer.

AS TO TECHNIC

HAT is technic? Technic, someone will tell you, is everything; another will tell you it is altogether a negligible quantity.

Some tell us today that in artistic work the brain and its conceptions alone are of real moment, that technic need not be considered seriously so long as the artistic instinct is freely fostered and

developed.

By this we are to understand that the enthusiast will in time so perfect whatsoever is necessary in the way of technical knowledge as a natural sequence, that, in other words, technic—or as much as is required—will come. Moreover, we are told that when technic is drummed in first, it is too often at the expense of destroying the natural bent, that it curbs the artistic genius; whereas, when the converse plan is adopted, the result is more satisfactory. There is doubtless much truth in this, though to the orthodox scientific mind it is heresy unbounded.

Nevertheless, we often find that the man who is strictly trained in the straight technical molds never gets beyond the cramping irons of his medium, his fetters become a drag, so that his soul may not soar, his genius (if he have any) has become a matter of equations, he too often remains a mechanical creator; on the other hand, the artist whose soul is really in his art, fostered and developed freely, will of necessity learn sufficient of the science of his work from sheer desire to express himself intelligently.

There is much truth in it, though we doubt if it would be a safe doctrine for general use. Were we all enthusiasts and geniuses, no doubt it would work well, but since we are not all anything of the kind, we fear the doctrine is a

dangerous one.

And, after all, there is much to be said for the thorough technical train-

ing.

We think one of the saddest sights is that of a man possessed of great artistic conception, an artistic temperament, a soul for great things, and filled with farreaching ideas, but without the power to create, without the capacity and faculty

to give his dreams form.

We have known men who were really great artists, men who had the most remarkable vision and insight coupled with a perfectly wonderful imagination, a combination such as in the hands of another might have created such things as would have been the world's talk and wonder, yet, owing to that sad restriction, the lack of power, the useless hand, these men were utterly incapable of doing anything.

These were cases where technic did

not come.

We have known a man whose soul was one vast realm of the beautiful in music who would have cheerfully given half of the remaining years of his short life to be able to play, yet could not play, nor could he ever learn. Of what use is the clever brain, no matter how original, without the power and faculty of expression?

When the unique brain is wedded to the clever fingers, trained carefully in the way of technic, then we have the

perfect genius.

None the less it should be borne in mind that the too prolonged grinding and drudgery of technical process tends to destroy the finer fibers, the truest and broadest feelings in art. This is especially seen in the case of music, where we too often find its votaries sharply defined into two widely distinct classes—the artist and the playing machine; the one embodying all the broadest and truest in his art, the other having reduced music to a mathematical piece of exact mechanism.

To give to the world his conceptions in proper form, the artist must be able to build in tangible shape. The painter, the musician, the sculptor, the photographer, each must learn the business and the rule of his media. And we doubt seriously if the irksome training in the ways of expression ever yet spoilt a true artist, a "budding genius;" he must of necessity rise above the schooling, some day, if he be really great. It is the small minds that are spoilt, fretted away by the drudgery, the men who would never have achieved great things. For no matter how perfect and thorough a man's

technical training, he can break the rules and soar beyond them when the time comes, if he wants.

In photography more than anything else the definitions laid down in innumerable text-books, coupled with the manufacturer's idea of perfection in plate and print, have been responsible for the crude unpictorial wealth of uninteresting work put forth as artistic.

In photography more than in anything else has the stress laid on technic been the stumbling block. In an art science whose very foundations are laid on optics and chemistry it is surely no

wonder.

Brilliancy by no means implies perfection, and a technically perfect negative is one that fully achieves the objects aimed at in its manufacture. Two men may take their cameras to a certain spot; one may produce a perfect photograph, the other a picture.

We do not want such a display of technic in our pictures as shall cry aloud of its virtues. When that happens, when every object is sharp and hard and brilliant, the print becomes

merely an exercise.

RAISE THE STANDARD

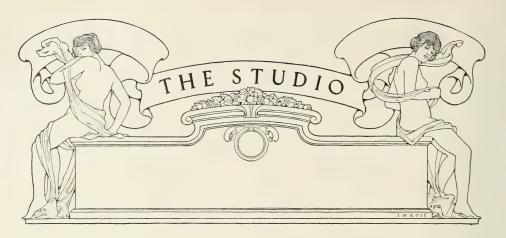
A FEW years ago the photographer seemed to consider himself the embodiment of knowlwdge, skill and ingenuity; in most cases his knowl-

edge was vast enough to enable him to follow a routine, produce a fair style of work, and not depart nor advance from it; his ingenuity and skill were most exercised in trying to prevent others from learning his process (which, of course, was the only good one); these selfish men are still in the old rut, and

are likely to stay there.

What a change for the better among the liberal MEN of the profession during the last few years! Now the best workers nobly come forward and instruct the anxious, even vying with each other in their endeavors to give the best methods for producing the best results; and, we ask, have not these men done themselves and our art great good by their liberal conduct? Does not photography stand higher today than ever before? Is it not growing in the estimation of an appreciating public? Has not photography already taken its place as a fine art? Has not the knowledge disseminated been the means of all this? Most emphatically we say YES. Let us continue the good work. As you improve the work of the whole profession, you elevate the profession, and soon it will be impossible for those unwilling or too lazy to come up to the standard to maintain their standing in the fraternity; they will be compelled to abandon a profession for which they are unworthy. Aim high; the public will appreciate good work, and photographers shall prosper accordingly.





PRACTICAL PAPERS ON STUDIO WORK AND METHODS

Clean Competition

The world is being turned topsy turvy by the European war, and the effects of it are reaching down through all the channels of trade and economic affairs. Some of the fundamental laws of trade and citizenship have been stopped, and unheard of orders have been laid down by all of the nations which take control of our lives and regulate them to suit the times and not the individual. There is a cult or political party called the Socialists, and they have certain ideals of life that are way in advance of the times, and while some are sound others are visionary.

But where to draw the line is becoming a very fine problem to solve, for some of the Socialistic propaganda that many have pronounced utterly impractical or impossible have been resorted to very successfully by the world at war, as war measures, it is true, but adopted nevertheless. We are not trying to discuss Socialism, and wish to state that we are not Socialists, and see clearly where they are aiming at the same goal as all civilized people, but believe they can get there by different routes than organized government.

But it is application of new principles to trade that we do wish to speak of, and especially the effect of these advanced methods adopted by the several governments as war measures, on our conduct of business, the photographic business in particular, during and after the war.

We are learning that we can make more speed by working together for the common good rather than each fellow for himself and the devil take the hindmost. We have coined a new word in the past year, and it is one that promises to become established in our economic life. The word is "profiteer." It means to exact larger profits than are warranted, by manipulation, selfish hoarding or by some means that are distinctly opposed to the welfare of the public in general and opposed to the orders and requests of the government during war times. It bears a sting and arouses the antagonism of every citizen who discovers, or believes that he has discovered, a "profiteer." In plain words, the people disapprove of a method that heretofore we have all countenanced and considered it shrewd and perfectly legitimate to put over. Now the idea is being spread throughout the country that it is a disgrace not to do business in a perfectly fair manner. If we are asked to close our places of business to conserve fuel, we are assured that all will play fair, and that if we close, our competitor will also close. We find that we get along better by clean competition than we do by putting over something on our competitors that is just a little bit shady.

Now we are getting at the kernel of the nut and the essence of the whole matter. The government is making us see that it is better for each individual to conduct his business in a straightforward manner and with honest consideration for his competitor. The average business man is having a new style of ethics crammed down his throat, and he conducts his business along these socialistic lines willy-nilly. If he finds that it pays from a financial stand-point and furthermore renders his business life more pleasant and enlarges his circle of friends in the trade, will he not be inclined to continue these practices when we return to normal conditions?

Our opinions of our competitors are gradually changing as we find that they can keep an agreement if they are of a mind to, and we begin to realize that the attitude of competitors toward each other have been one of mutual suspicion. You are suspicious of your competitor and are willing to believe any story you hear as to his crooked methods. But you are coming to a realization of the fact that your competitor most probably has exactly the same opinion of you. Efforts to make a sale may seem perfectly legitimate at the time, but from the view-point of a competitor it is a violation of all the ethics of business, and indicates an utterly depraved moral status.

If the war does nothing else than clear the business atmosphere of these mutual suspicions, it will have accomplished a great work for American trade. We do not believe that jealousy in trade is confined to the photographic business, for we see unmistakable signs that it is ground

into the fabric of all American trade. Among the big industries it approaches the dog-eat-dog theory, and that is nowhere illustrated more clearly than on what is called Wall Street, where it is clearly understood that business is a matter of wits, capital and cunning. It is considered sporty to take your losses like a man when the other fellow puts a trick over and cleans you out of your last dollar. You would have done the same thing to him if you had had the chance.

In the photographic business we are prone to center our attention on the immediate order that is in prospect, and we have felt that if we did not succeed in getting that order we had lost an opportunity which the other fellow had taken or would take if he had a chance, so, in order to keep him from getting any business or even from having a chance of taking the order, the business is clinched at the expense of an established price or of the respect of a customer. Done once, it is the natural and easy thing to keep it up.

the natural and easy thing to keep it up.

In Denmark they have established committees or trade commissioners who exercise a control over trade in a community to an extent that we would not tolerate, but which works well in that small, intensive country. They make their business life a big family affair, and the board considers the conditions in a certain trade and if there is no opportunity for more competition they will exert their powers toward preventing a competitor from settling in that locality. Their principle being one of common-sense, that there should be a sufficient number of merchants to fully provide for the wants of the community, yet not so many but that each one may find the work remunerative. They do not kill competition, but regulate it. We are not at all sure that such a system would work in this country, yet it is a very sensible method of keeping the business in a healthy condition.

It would be a wonderful help to our business if we American business men could do voluntarily what our government is compelled to ask us to do in the stress of war, and what a small country has been compelled to do by the stress of competition and limited opportunity. If we could preserve our great American initiative and yet attain a state of clean competition where effort would be made to build up the business in general rather than make a sale at the moment, we could do this impossible thing. At any rate, we now have an opportunity to try it out, and the first step is to acquire patience toward our competitors.

Patience and more patience. Backbone in our own ability to live under clean competition without it being necessary to resort to any cunning methods that may be construed as unfair. We feel sure that business under such conditions will be found much more pleasant, and, we believe, more profitable also. We are face to face with an opportunity, and business men in all lines are thinking about the advantage of preserving what we have been compelled to accept. It would seem a shame to lose this opportunity.—*Trade News*.

Spring Cleaning

Now that the days are getting longer and brighter, many photographers will see more

clearly the shabby places in their studio and showroom. Where business has been exceptionally brisk, as we know it has in many cases, there will be no difficulty in getting such details attended to. But in other instances, such are the accidents of geographical position nowadays, business has not been up to the average, and there is little or nothing to spare for decorative work. Nevertheless, anything in the way of a down-atheel appearance of the premises must be avoided, for this is the beginning of a "vicious circle, as the doctors say, and things rapidly go from bad to worse. If a photographer has any trace of the handiness of a handy man, he may do a very great deal by the expenditure of a very few dollars, and that without any feeling of having done the painter out of a job, for is it not nowa-days a difficult matter to get labor in any trade or industry? Only the professional classes, architects, lawyers, and so on, are "out of work" at present. Floors may often be very much improved by restaining and varnishing, and for this there is nothing better than a mixture of equal parts of Japan black and turpentine, applied with a stiff, flat, hog-hair brush. This is absorbed by the wood, and should dry almost dull. Two coats may be applied, followed by a couple of coats of a hard-drying oak varnish. The appearance of such a floor, or "surround" only, is much improved by the application of beeswax in the usual way, but this should not be done until the varnish has had a week or two in which to harden thoroughly. Woodwork may be cleaned down and then given a coat of paint of the same color, and if the color is dark, varnish may be added to the paint so that a glossy appearance will be obtained without the need for an extra coat of varnish. It is well to get the painter to mix the paint, rather than to rely on many of the ready-prepared tins of paint, which are not always of good quality.—British Journal of Photography.

Catching Up with the Increased Overhead Expenses

"What are you doing to increase your profits?" was asked several photographers recently. One or two replied promptly that they had increased their prices accordingly, others that they intended to, but others stated that it was impossible to raise their prices, that they were getting all that they could get from their customers at the present time, and they realized they were doing business on a very small margin of profit.

One photographer answered promptly: "I charge more per dozen for my pictures and get it without any trouble."

Here is the way he figures: The average price per dozen for 4×6 prints in a slip-under 7×11 folder was \$6.00 and all the photographers in his city were using a certain grade of mount, different styles but all costing about the same. He purchased a better grade of mount, paying \$40 per M more than the others. Forty dollars per M is only 4 cents each, or 48 cents per dozen, and with these folders he found that he could easily get from \$1.50 to \$2.00 more per dozen for his 4×6 portraits. When he had settled

the price on the 4 x 6 he found it very easy to increase his price on all larger sizes.

The majority of customers look at a picture There are and folder together, not separately. some folders which look the price which you ask for them, and there are some that do not.

One photographer tried to figure out that by sticking to his old price and buying the lowest priced stock he could increase his business, and in this way keep up with the overhead expenses. We do not believe this is possible. In the first place, increased business means an increase in overhead in the way of salaries and an increased stock bill for supplies, and in the second place it is going to be very hard to secure extra help for any purpose whatever during the next three

There is only one way which is fair to you and fair to your customers, and that is to increase your price on every style of picture while doing business.—Ohio News.

Making It Easy

THE aim of the modern business man, when he has something to sell, is to make it easy for someone to buy it, and this means that not only does he strive to save his customers all possible physical exertion, but that he goes as far as he can to save them from the terrible strain of "making up their minds." En passant it may be remarked that usually the more insignificant the mind the more difficult it is to make up, so our shrewd friend sets to work to impress upon all and sundry that he, and he alone, has just the article they require, and that they will forever regret if they miss the bargain which he so generously offers them. In recent years great changes have been made in such trades as the bootmaking and tailoring by the adoption of these methods. A quarter of a century ago no one with any pretensions to fashion thought of buying ready-made boots; they were looked upon as inferior in quality, clumsy in design, and uncomfortable in wear; but one day the readymade bootmaker woke up (or did some smart foreigners wake him up?), and he said, "I will make it easier for the public to wear my boots than to go to a bespoke maker, wait three or four weeks, and then only get a moderately good fit." Not only did he resolve to do this, but he accomplished it, and today the ready-made bootshops of our principal towns are stylish in appearance, elaborate in their accommodation, and doing good business, while the made-to-measure man sits behind his wire blind and deplores what he thinks is only the rage for cheapness.

A parallel to this may be found in the way many portrait businesses are carried on at the present day. Most people feel when they visit the photographer that they are not at all sure what they want, except that for some reason they have to sit for a portrait. This, of course, gives an opportunity for the smart receptionist to sell them more both in size and number than they actually require, and there is nothing that so effectually prevents subsequent visits to any establishment than a feeling of having been jockeyed into a greater expenditure than was originally intended. One great difficulty is

raised by the photographer thinking in dozens when the public have ceased to do so. people enter a studio nowadays with the idea of ordering a dozen expensive portraits, and if they get the impression that they are expected to do so it acts as an effectual deterrent. If the pictures are very pleasing large orders may follow, but that the initial order should necessarily be a large one is a mistaken idea. In these circumstances the practice already adopted by a few photographers of making a moderate inclusive charge for a sitting and a set of proofs has much to recommend it. In the first place, the initial speculation on the part of the sitter is not a great one, and in the second place the photographer is relieved from his greatest bugbear -a resitting without payment. Even if the proofs do not quite come up to the sitter's expectations, they are worth keeping, and another sitting can be had on the same terms without any feeling of obligation on either side. In some cases the proofs would be all that were required at the moment, and if more were required at a later date a reorder could be given or a fresh sitting arranged. It is, of course, necessary to state clearly the price of subsequent copies at the time of sitting.

In a more modest class of business the same end may be attained by quoting for small numbers, such as three or four prints. One photographer who has done this tells us that such a practice has proved an excellent "thin edge of the wedge." It is pointed out to the sitter that for each three prints ordered an additional position is taken, and this frequently leads to a better order from a person who only intended to have the minimum number in the first instance. Another innovation, which is to the photographer's benefit and does not seem to be objected to by the customer, is the charging of a flat rate for original sittings and reorders; this appears quite reasonable to the sitter, and helps to make up for the increased cost of

materials.

One direction in which it may be made easy to order is in some way clearly intimating the price of such items as frames, enlargements, miniatures, and coloring. Very often no immediate order will result, but later a necessity for a present may arise, and if the cost be known, the photograph comes into the running as a possible acceptable article. If a customer knows exactly what can be done for five, ten, or fifteen dollars, he is more likely to place an order than if he has to make a special inquiry, and perhaps feel that the saleswoman is wondering how much she dare ask him. Plain dealing and one price to all comers is the order of the present day, and there should be no more difficulty over ordering photographs than in buying groceries, and those photographers who realize the fact and act accordingly will assuredly have no reason to regret it.—British Journal of Photography.

The Girl Printer

THE war has absorbed so many men into the army, and, withal, made photographers so busy with a certain class of work, that at the present time there is a great dearth of printers, especially males. Therefore a greater number of girls will

come forward to fill the ranks.

This is the one branch of photography that girls have rather hung back from taking up, and not without reason, for it is physically hard work even under the best of conditions, while under

poor ones it is drudgery.

Of course, what the conditions are rests largely with the employer, though I think that often, if the folly of allowing such a state of affairs were pointed out by printers-in the right I mean, not simply one of fault-finding or criticism—and its natural reaction upon work, many of these conditions might be

There are one or two things that ought to be considered by all those who employ girl printers. One thing is that a girl has not the same physical or muscular strength as a man, and, therefore, her conditions need to be somewhat different in order that she may cope with the same amount of work. Now all dark-rooms, whether for paper printing or for the development of negatives, ought to be well and carefully planned and fitted, for the sake of speed and convenience in working as well as for the health of the worker.

Two things are very necessary—ventilation and warmth, both for the worker and the work. Where a regular printer is kept, printing will, of course, be a regular daily operation, and as the bulk of modern printing is on bromide paper, we may for a few moments leave daylight

printing aside.

Whatever kind of sink is in use, a good high splashboard should protect the front of it, to just a comfortable working height for a person of medium size, and a light framework of strips of wood should cover the floor-more especially if it is stone—in order to keep the feet dry and warm, and this should be put out to dry each night for the sake of the worker's health.

The dark-room ought also to have some kind of window, which can be opened now and then to change the chemical atmosphere and let in

both light and fresh air.

The modern gas radiators are excellent and healthy for warming the dark-room, and small ones can be bought or hired quite cheaply. The working space needs keeping as clear as possible, and all stocks of paper should be stored on shelves of moderate height-not too high, or the hot air may injure them.

An old and light mackintosh coat with the

sleeves cut short is an excellent thing for the girl printer to wear when at work, to protect her from splashings, and she ought also to be provided with light rubber gloves, which avoid

finger stains.

I know that printing is usually considered to be a somewhat monotonous task, but the more thought the girl printer gives to it the less she will suffer from this complaint, while her work

will gain in quality accordingly.

Of the many different makes of paper and post-card on the market no two will be found to be quite alike in working; some are quicker printing, some yield more black and white prints and some grayer ones, in the same bath. Others, again, lose in the fixing, while some darken; and some darken in drying, while others dry a different color.

To acquire a correct knowledge of all these

points—a knowledge which any good printer should certainly possess—calls for a good deal of close observation; and also it is useful to keep handy a small note-book, to make notes on the comparative speed of any new paper against that of any better-known one, etc. The girl printer should also bear in mind that systematic working lessens drudgery and ensures better results. Some girls will always make up the same quantity of solution each morning without considering whether more or less will be needed. Now if it is early closing day you surely would not expect to need so much, while if there should be an extra big batch of printing, of course you will want more, and to have to stop in the middle, to make up more, shows want of thought and reasoning power.

Most printers when starting work roughly classify their negatives either according to number ordered, style of print, or quality of negative according to their own ideas, or else according to the urgency of the order.

And now comes one point sometimes forgotten. How many prints are you to attempt? Of course, most people have their own different ideas, but one or two things serve as very useful guides. How many prints can you handle successfully at a time without spoiling any? How many have you room to lay out to dry at a time? and What is the most thorough and economical way to wash and dry the batch?

One thing you should remember—others have to follow you with the trimming, mounting, and finishing, and it is not fair to muddle your work so that they are sometimes practically without work, waiting for you, and another time rushed to death with a huge batch, so that they don't

know which thing to do first.

One thing certainly does seem to me wise, and that is to do all sepias first, so that they may be finally toned and laid out to dry with the rest, while as a matter of fact sepias often get put

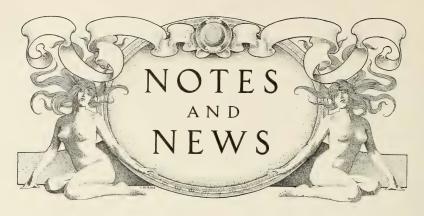
aside, and so orders get behind.

Girls are nervous, and therefore need to guard against jerkiness of movement, especially when exposing, or exposure will be uneven and the resulting prints vary; and the eye, too, needs much training for the correct placing of prints, for it is sometimes impossible properly to trim an ill-placed print, and a short order means vexation and worry for the receptionist who is responsible for sending them off, and waste of time in again looking up the negative and making stray prints, and for the same reason do one spare print to each order in case of accident.

A printer should be able to gauge her exposure with sufficient correctness so that she will not usually have to stop making "trial prints," or even to develop each order as printed, if working alone, but to do first the printing, and then develop and fix and wash. This is much quicker, and all printers should strive for speed and accuracy, if only for their own sakes, so that as soon as fixing is over the window may be opened and light and air let in. I think that all dark-room workers need to be especially careful of their health and spirits.

Light wooden or compressed paper dishes are much easier for the girl printer to handle, for girls have not the same lifting power in their

arms that men have.



"Year-Book" of Pictorial Photographers of America

PRESENTED in a very tasteful form comes the first year-book, setting forth the aims and activities of the Pictorial Photographers of America, an organization of well-known men and women, who have pledged themselves to engage in an effort to place photography on the highest plane. Their accomplishments thus far have been most creditable and with further coöperation along broad and sincere lines should mean much toward enlarging the field of fine craftsmanship for pictorial photography in this country.

Besides full reports, this booklet contains excellent examples of the work of Gertrude Kasebier, Clarence White, Alvin Coburn, Arthur D. Chapman and others, and will be of special interest to every photographic worker who cares to apply for a copy by writing the Secretary, care National Arts Club, 119 East 19th Street, New York City.

The New "Burt Exposure-meter"

A NEW exposure meter has come to hand, made by A. J. Burt, Jr., of Chicago. We have examined it with interest and find it simple to manipulate, compact and light in weight, being made of aluminum, measures an inch and three-quarters in diameter and a sixteenth of an inch thick. Although the meter is practically for the vest pocket it can be readily adopted to the needs of amateur or professional. Scales for different latitudes are furnished.

The Clarence H. White School of Photography Summer Session

The ninth Summer Session of the school will be held from July 8 to August 17, 1918, at Canaan Connecticut. The summer school is intended to give the student the advantage of instruction with a profitable and pleasant summer outing. Canaan is situated in a beautiful valley in the Berkshire hills of Northern Connecticut, and is about four hours' ride by train from New York City, the fare for the round trip being \$4.90. The country furnishes abundance of photographic material, comprising, within easy walking distance of the school, farms, rolling uplands,

streams, rugged mountains, and architecture of typically New England character. Numerous industries, such as iron furnaces, lime kilns, and the like, afford abundant opportunity for pictorial work. The neighborhood is by no means thickly settled, and those who enjoy the seclusion of country life will find it there.

THE CLARENCE H. WHITE SCHOOL OF PHOTOGRAPHY is founded for the teaching of the art and science of photography and for the training of its students for the vocation of photographer.

Instructors: Clarence H. White, *Director*, Paul L. Anderson, Max Weber, Bernard S. Horne.

APPLICATIONS for accommodations should be made to Mr. White or direct to Miss Louise Bragg, The Maples, Canaan, Conn., at the earliest possible moment.

For further information, address Clarence H. White, 122 East 17th Street, New York City.

The Eastman Kodak Company in the War

WE learn that Mr. Frank S. Noble, director and assistant treasurer of the Eastman Kodak Company, has been appointed by the United States Government Director of the Rochester Division of U. S. Munitions Production. To undertake this work, he is temporarily relinquishing his duties in the Eastman Company, and devoting himself to the expedition of war supplies throughout the munition works in his district.

The Rochester works of the Eastman Kodak Company, in addition to being the scene of important munition supplies, is now also a temporary school of photography for the training of a thousand men in this branch of military service. The newest and largest building of the Kodak works—that for baryta-coating, and possessing a floor space of nine acres—has been allocated in part to the U. S. Signal Corps, under whom the training of men for the photographic service is being carried out with the assistance of some fifty technical instructors drawn from the Eastman Kodak staff. These provisions are temporary only, and have been accepted, on the offer of the Eastman Kodak Company, until a permanent school shall be completed at one of the large flying centers about August next.

"Serchol" a Substitute for Metol

This is a British-made developer and is a good substitute for metol. Charles G. Willoughby, Inc., of this city are the agents for the United

Serchol has been tested by us, both by itself and in conjunction with hydroquinone, and in both cases seemed to be exactly what such a developer should be. For negative work we used a solution containing approximately half a grain of serchol, six grains each of crystallized sodium sulphite and sodium carbonate, and one-tenth of a grain of potassium bromide to the ounce, and obtained clean soft negatives of a fine black tone, with ample gradation, on some of the most rapid plates on the market. For gaslight prints the two-solution developer containing both serchol and hydroquinone, the formula for which is given in the packet, we found very satisfactory. single solution formula of the same type can also be made up in accordance with the directions.

The makers point out that serchol keeps well in solution, and quite indefinitely in the dry state. When substituted for metol it should not be used in a greater strength than one grain and a half to the ounce of solution. If this is observed, and if the serchol is always dissolved first, the sulphite being then added, there will be no fear of the precipitation which has often been so troublesome

in the case of solutions of metol.

Central "Process" Plates

THE Central Dry Plate Company, of St. Louis, announces their new "process" plate with the sincere conviction that the photo-engraver will

recognize a "dry plate with wet plate quality."
The "Process" emulsion is compounded from a complete and thoroughly definite knowledge of necessary requirements, and crisp negatives of satisfactory excellence for either line or half-

tone may be obtained with ease.

The Central "Process" plate will give a clean sharp dot with the absolute minimum of irradiation or halation, consequently the space between is clear and bright, while the film being extremely

thin assures rapid drying. Central "Process" plates are not colorsensitive and are intended for use wherever the regular wet plate would otherwise be required. Color-sensitive process plates of the same high quality are in preparation and will shortly be available.

To the general commercial photographer the "Process" plate allows of the production of "Process" plate allows of the production of negatives of extreme contrast with ease and

certainty, and is well worth a trial.

Color Photography Methods Demonstrated

In the final lecture of the semester in the Tuesday lecture course, Professor McElfresh gave an interesting resumé of the methods of color photography recently in the Thompson Physical Laboratory at Williamstown, Mass., says the Record, of that city. The three general methods of producing colors were described in detail by the use of charts and specimen slides illustrative of each process.

The Lippmann process, originated by a French physicist, is theoretically the most remarkable of all the ways now known of producing the colors of nature in photography. No artificial colors are used, and the results are entirely natural. The method is based on the theory of light waves. Various colors are formed by different lengths of light waves. When these waves are reflected on themselves there occur stationary points, called nodes, which are onehalf the length of the wave apart. By the use of a reflector of mercury behind the film, these nodes are reproduced in the film by the layers of silver bromide in the emulsion. Thus the layers of silver are as far apart as one-half the wave length of the color which produced them. When white light is projected through the film only the color from the constituents of white light which previously acted upon any certain portion of the film can penetrate that portion. In this way the white light is separated into the requisite colors which are needed to produce the picture. Films made by this method show verisimilitude only for the primary colors, however, and thus the process is not practicable for commercial work, although it is scientifically interesting.

Professor McElfresh next demonstrated the Ives process, which relies on the fact that all shades of color may be made from the proper mixing of red, green and blue light. The picture then is taken in triplicate through red, green and blue lens. Only portions of the object occur in each film, but when the three are superimposed with their respective colored light projected through them they define the object in its natural

colors.

The Joly process of producing colored slides has been that from which the commercial method developed: It depends for its success on the use of a color screen before the film. With this screen of red, blue and green lines the greater portion of each object appears in its natural colors, and at a distance the illusion is complete. The improvements in this process have been in perfecting the screen so that now no indications of its presence appear. Several illustrations were shown of the brilliantly colored slides made by this method.

The last and most mechanical of all the processes shown by Professor McElfresh was that of using several plates susceptible to certain colors. Each plate was afterward dyed with the complement of the color which it photographed. By the superimposing of these plates a very natural

effect is gained.

Missouri Valley Convention

MISSOURI has had her State conventions. Kansas has had hers and Nebraska hers. Three years ago the spirit of progression, coöperation, and amalgamation permeated the several associations and to day we have the Missouri Valley Association.

We do not need to call the attention of those who are accustomed to attending conventions to the unusual success we have attained in so short a time, but to the many self-satisfied photographers throughout our territory we proclaim our mission.

The Missouri association stands for advancement, both photographic and commercial.

Many successful men attribute their success to the inspiration received by attending conven-

tions.

The high standard of quality of everything photographic has been attained by the comparison of work and association of men, so that today we have a common standard by which we can nearer measure our product than ever before.

The attention of every intelligent photographer is now directed to not only producing photographs of merit, but as never before are we led to the realization that our profession must be organized and vitalized with the commercial idea. With this fully developed we will take our proper place as individuals among those in other lines of business activity. With this uppermost in the minds of the officers of the Missouri Valley Association the program for the 1918 convention is launched.

The board met in Kansas City, Mo., March 1, and unanimously agreed that our meeting should

be strictly a business convention.

The war has created a demand for photographs and, this being true, photographers are in a serious business and our program is to be along vital lines.

Every photographer, whether located in the city or small town in our territory, must comprehend that his duty is to associate himself with our organization and through our organization

with the national association.

The Government is demanding a service that must have the backing of every man in the profession, and in order to accomplish the largest results a concerted effort is required of everyone. This can only be made effective by uniting with your association.

We will receive our orders from those higher in authority. Will you be in your place July 8

to receive this information?

The place is Kansas City, Mo.

Headquarters, the Dixon Hotel, where all ses-

sions will be held.

As president of the association I appeal to the photographers of Missouri, Kansas and Nebraska to set aside this week and avail themselves of the privilege of meeting and counselling with others of like faith.

In the meantime your officers will be alert to our needs as a profession and our obligation to the world. The 1918 convention will be the clearing house from which we trust all will return to their homes with new visions and ambitions.

Fraternally,
ALVA C. TOWNSEND,
President, Photographers' Association of the
Missouri Valley States.

A Practical Guide on Developers

A PRACTICAL guide to all the methods of developing the negative which have been proved in practice, with explanation of their advantages and working instructions covering their use is embodied in the February number of the *Photo Miniature* under the title, "How to Develop the Negative." Publishers, Tennant & Ward, New York.

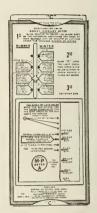
"Photograms" for 1918

Photograms of the Year for 1917–18 is now being printed. Paper shortage and difficulties in obtaining good blocks are said by the publishers to be the cause of the delay, and we can well appreciate the situation.

The New Harvey Motion-picture Meter

The Harvey Motion-picture Exposure Meter is a new departure in meters and among other features shows cuts of the shutter settings or angles instead of fractions of a second, and gives automatically the proper stop to be used for any lens.





No calculations are required.

This meter is only to be used for outdoor motion-picture cameras, and it is not suitable for other cameras.

The meter, moreover, is thoroughly practicable for motion-picture cameras, owing to the fact that with the shutter half-open at a cranking speed of two turns per second the exposure is $\frac{1}{\sqrt{2}}$ second; but if the cranking speed is changed so that you have, for instance, $1\frac{1}{2}$ turns per second, then the exposure is $\frac{1}{24}$ second; and if the cranking speed is but one turn per second the time changes to $\frac{1}{16}$ second, and the same way with the other settings of the shutter. For this reason no meters heretofore seem to have taken care of this fact, and it was necessary to remember all these figures; whereas with the Harvey meter a person sees at a glance the correct exposure for any shutter setting. There are many other features which are carefully described in the circular No. 25 and can be had upon application. We have given this new Harvey meter a fair test and find it dependable, accurate and serviceable.

Useful Booklets for the Photographic Worker

The Bausch & Lomb Optical Company, Rochester, N. Y., states that at present its photographic and photo-engraving catalogues are out of print. Their catalog of projection apparatus together with several pamphlets of projection information are still to be had, as well as the two very useful booklets, "Useful Tables for the Photographer" and "What Lens Shall I Buy?"

\$3000 in Cash Offered in the 1918 Kodak Advertising Competition

This is a competition in which pictures with advertising quality will win. The Eastman Co. want good photographs, but the most perfect photograph may be the one with the least advertising value.

Just so sure as you look at the right kind of an advertising picture—even glance at it—that picture has delivered its selling message, for the

point of a picture gets over instantly.

And then just so sure as your eye is caught by the illustration, there is a precious second in which you say to yourself "I'd like to do that," or "That looks like fun," and, without conscious effort on your part, you are reading the lines of type below.

The right kind of an advertising picture does all the work. It stops the eye, arouses the interest and, supplemented by the text, drives

home the story.

They want pictures of the right kind to use in magazine advertising—pictures that will make people enthusiastic over Kodaking, that will impress them with the pleasure of photography, that will convince them of the fact that Kodak took the bother out of picture making long ago. In short, pictures that will sell Kodaks.

Such pictures are worth real money—the prize awards of the 1918 Advertising Competition make fourteen of them worth three thousand

dollars.

In this competition, recognized professional photographers, including commercial and newspaper photographers, in short all persons depending upon the use of a camera for a livelihood, will compete in Class A. Class B is open to amateurs only.

Each picture is to contain a figure or figures and is to be suitable for use as an illustration in advertising the Kodak or Kodak system of

amateur photography.

Each print in Class A must be from a negative 5 x 7 or larger. As pictures are often reproduced in large sizes in our advertising, large pictures will be given preference, everything else being

equal.

The winner of a first prize shall be awarded no other prizes, and no competitor shall be awarded more than two prizes. A competitor, however, may enter as many pictures as he desires and at any time before the close of the contest, November 1, 1918.

THE PRIZES

Class A—Professional Photographers Only:

First Prize				\$600
Second Prize				400
Third Prize				
Fourth Prize				200
Fifth Prize		٠.		200
Sixth Prize				200
Seventh Prize				200

Full particulars of the contest and rules governing same may be had from your dealer or will be mailed on request.

Valuable Booklets for the Photographer

The Eastman Kodak Co., Rochester, N. Y., issue from time to time valuable booklets for the photographic worker. You may obtain for the asking the beautifully illustrated catalogues of "Kodak and Premo Cameras," "Negative Making on Seed Plates," "The Velox Book," "At Home with the Kodak," an illustrated manual on home portraiture, "Artura Results," "Color Plates and Filters for Commercial Photography," "Collodion, the Wet Plate Developer for Photo Engraving," "By Flashlight," "Enlarging: a Few Suggestions for the Professional Photographer," "Bromide Enlarging with a Kodak," and "About Lenses."

Announcement

It is announced that owing to the greatly increased cost of production and distribution the publishers are compelled to make an advance in price of *The Photo-miniature* to 35 cents per copy—\$3.00 per year postpaid. This advance in price will apply to all numbers in print and new numbers to be published.

Why One Photographer Did Not Succeed

A FEW days ago an old-time retired photographer dropped in to see us for a little chat and it was perfectly natural that we should talk over photography and the photographers of a few years ago. He spoke of one photographer which we explained to him had sold his studio and was evidently down and out of the business.

It happened a few years ago that both of us were in this studio at the same time (the writer looking after business and the photographer on a friendly visit), two ladies, well dressed, evidently mother and daughter, came into the studio. He was talking with us in the operating room from which we could see everything going on in the reception room. After he had let them wait about fifteen minutes, he went out with a butt of a cigar in his mouth, asked them what they wanted. They explained to him they were looking for photographs for the younger one and he shuffled a bunch of photographs under their nose on the table, "Which kind do you want?" They began to ask questions regarding certain styles of photographs and mountings and we heard him reply to them, "There is the kind we make in this studio, if you want them, we will make them for you," and the tone was not very pleasing. They soon left without a sitting and he came back into the operating room and said that they were too particular for him and didn't care to make photographs for that class of people. Do you wonder that he is down and out?

This reminds me of another photographer that within ten years' time has had studios in six different places. That one of his daughters was working in a millinery establishment, another teaching school and supporting the family and he is only a young man, right in the prime of life. But, we remember hearing him tell customers that he only made one negative of anyone; he was so sure of getting something that was absolutely O. K. that it wasn't necessary. It

was only the second-class photographers that made a lot of negatives. He is down and out.

Both men were good workmen, but they had no tact, did not understand salesmanship and drove customers from their studios. It used to be that when people wanted photographs, they would come to the studio, tell them what they wanted, pay the price, wait until they were finished and be satisfied. Now, it requires skill, salesmanship and tact to carry on a studio and make a success of it. Times have changed and we must change with them.—Ohio Photo News.

News Photographers Wanted

THE Signal Corps is in urgent need of expert news photographers. Men selected for this branch of the service must furnish satisfactory evidence as to their actual experience as staff photographers with some newspaper or news syndicate company, furnish three letters of recommendation, and must be American citizens by birth. It is essential that they be thoroughly familiar with the use of a Graflex and other speed cameras, as well as various makes of lenses, their speeds, focal lengths and the manipulation of various makes of view cameras in connection with ordinary photography and telephoto work.

A request is made for the best available news photographers in this country to make photographs of important happenings in France. These pictures are to be preserved for future educational work in our schools and colleges and for a pictorial history of the war. It is intended to send the men selected overseas as soon as they have completed a short course in military training in this country. Upon the completion of this course they will be commissioned sergeants,

first-class.

Photographers who desire to see actual service in the nearfuture should immediately communicate with the Air Service, Training Section, Photographic Branch, marking their com-munications, "For the Attention of the Officer in Charge of Personnel," War Department, Washington, D. C.

New Commandments

1. Thou shalt not wait for something to turn up, but thou shalt pull off thy coat and go to work, that thou mayest prosper in thy affairs and make the word "failure" spell "success."

2. Thou shalt not be content to go about thy business looking like a loafer, for thou shouldest know thy personal appearance is better than a

letter of recommendation.

3. Thou shalt not try to make excuses, nor shalt thou say to those who chide thee, "I didn't think."

4. Thou shalt not wait to be told what thou shalt do, nor in what manner thou shalt do it. for thus may thy days be long on the job which fortune hath given thee.

5. Thou shalt not fail to maintain thine own integrity, nor shalt thou be guilty of anything that will lessen thy good respect for thyself.

6. Thou shalt not covet the other fellow's job, nor his salary, nor the position that he hath gained by his own hard labor.

7. Thou shalt not fail to live within thy income,

nor shalt thou contract any debts when thou canst not see thy way clear to pay them.

8. Thou shalt not be afraid to blow thine own horn, for he who faileth to blow his own horn at the proper occasion findeth nobody standing ready to blow it for him.

9. Thou shalt not hesitate to say "no" when

thou meanest "no," nor shalt thou fail to remember that there are times when it is unsafe

to bind thyself by a hasty judgment.

10. Thou shalt give every man a square deal. This is the last and great commandment, and there is no other like unto it. Upon this commandment hang all the laws and profits of the business world. Yeoman Battle Ax.

Worth While

At times a man gets a fool notion that he must be a nasty, cursing, irritating sort of a creature, provided he can pretend to the public that the reason for his general nastiness is the fearful load of responsibility he carries all the week, but when the children crawl under the bed, and the cat hikes for the back fence, and the dog growls and the neighbors call their children into the house when they see him coming-there's something wrong, even when the man thinks he is making sweet music by rattling loose change in the shape of five-dollar gold pieces in his pocket. A little gold in one's heart, a little milk of human kindness and consideration in one's veins and a little laughter in one's voice is worth more than a lot of gold in the bank or pocket. We all have known such men.—The Red Envelope.

Thrift

WITHOUT me no man has ever achieved success. nor has any nation ever become great.

I have been the bedrock of every successful career, and the corner-stone of every fortune.

All the world knows me, and most of the world heeds my warning.

The poor may have me as well as the rich. My power is limitless, my application boundless.

He who possesses me has contentment in the present and surety for the future.

I am of greater value than pearls, rubies, and

Once you have me, no man can take me away. I lift my possessor to higher planes of living, increase his earning power, and bring to realization the hopes of his life.

I make a man well dressed, well housed and

well fed.

I insure absolutely against the rainy day. I drive want and doubt and care away.

I guarantee those who possess me prosperity and success.

I have exalted those of low degree and those of high degree have found me a helpful friend.

To obtain me you need put out no capital but personal effort, and on all you invest in me I guarantee dividends that last through life and after.

I am as free as air.

I am yours if you will take me.
I AM THRIFT.—American Bankers' Association.



WORKROOM

ONTAINING THE LATEST PROCESSES, FORMULAE AND APPLIANCES NEEDFUL IN THE ART OF PHOTOGRAPHY FOR THE OPERATOR & WORKER

WHEN TO STOP DEVELOPMENT WHAT IS THE MOST POPULAR ANGLE? A METHOD OF MOUNTING FILM NEGATIVES ON A GLASS SUPPORT ABOUT FOCUSSING WATERPROOF DARK-ROOM BENCHES A DEVELOPING TIP FIXING AND WASHING STRAINING PRINTS A MODERN WET-PLATE FORMULA A PERMANENT DEVELOPER FOR TANK USE COPYING WITH MIRROR THE STRAIGHT PRINT AND TECHNIC HOME-MADE SENSITIZED POSTCARDS IMPROVED BROMIDE PRINTS MODELLING THE SENSITOMETRY OF ROENTGENOGRAPHIC MATERIALS A CONVENIENT RULE FOR FOCUSSING IMPROVEMENT OF NEGATIVES BY MEANS OF METHYLATED SPIRITS FORTY WAYS TO SPOIL A PICTURE FIXING LARGE BATCHES A TIME-SAVING HINT IN PINNING ENLARGING PAPER TO EASEL THE WIDER LIMITS OF DEVELOPERS

ONE OR TWO LITTLE THINGS WORTH REMEMBERING CORRECT EXPOSURES FOR ENLARGEMENTS
NON-ACTINIC LIGHT FOR PHOTOGRAPHIC USE



THE WORKROOM

By the Head Operator



When to Stop Development

The degree of sensitiveness of the emulsion on the plates used plays a not unimportant part in the intensity of the negative, and it is well to bear this in mind when developing. It is a fact proved by practice that the more sensitive a plate is the more slowly it intensifies on develop-ment. One should not, therefore, when treating the ultra-sensitive plates that have been introduced in recent years, remove them from the developer too soon, for not only does the development proceed more slowly in this case, but the fixing-bath likewise, while acting slowly enough, also reduces perceptibly the density obtained in developing, because it dissolves more of the unreduced silver than when using plates of medium sensitiveness, which are not so rich in bromide of silver. It may be said that ultrarapid plates should be developed for about double the time given to those of medium sensitiveness. By doing this, just as fine negatives can be got with fast plates as with the slower ones. Very often extra-rapid plates give only gray and weak negatives by reason of some defect.

It has also been observed that the negative gains more or less readily in intensity according to the reducing agent employed in the developer, and that the fixing-bath reduces that intensity more or less. For instance, hydroquinone alone and pyrogallic acid give good intensity very quickly, while metol, diamidophenol, and even edinol, give the details first while intensity comes but slowly. According to the nature of the reducer, therefore, development should be more or less prolonged in order to get a negative of normal density, other things—i. e., time of exposure, temperature of the baths, etc.—being

egual.

Neither should the influence of exposure on the strength of the negative be overlooked. When the exposure is insufficient, the image gains in density very slowly, while with over-exposure

this takes place much more quickly.

It should be remarked on this subject that, for all those factors we have mentioned, what is true of the developer is equally so of the fixing-bath, and, other things being equal, the time in the latter should be proportional to the time of development, since in the case of thick or double-coated plates, under-exposure, very sensitive emulsions, or even of a reducer that gives density but slowly, the fixer acts with less speed, just like the developer.

It should also be noted that the clearing of the negative in the fixing-bath is proportional to the duration of the fixing; which is not saying, however, that the hypo-bath weakens the image, since once the fixing is complete the plate may remain in the bath for a quarter of an hour or

more without any perceptible weakening of the negative.

But to return to the arresting of development: It may be set down as a rule that it should be stopped when the high-lights begin to show through on the glass side of the plate, excepting when there are clouds, in which case there should be less intensity to save the sky from being

"burnt."

When there is any doubt it seems preferable to over-develop an over-exposed plate so as to try to get more vigor in the prints. In case of underexposure, on the contrary, the plate should be slightly under-developed. In this case a prolonged immersion in the developer does not bring out the details as is sometimes thought. The extra development only intensifies the highlights, giving a hard negative, whose density would have to be reduced in order to get a passable print, while by developing a little shorter time a somewhat weaker and softer negative would result but containing just as much detail as if development had been much longer, and capable of giving good prints with a slow gaslight paper.

The Watkins method—which consists in multiplying by a special coefficient for each reducing agent the time taken for the appearance of the first outlines of the image after its immersion in the developer, and prolonging the immersion for the time indicated by that multiplication—renders real service to beginners, provided that they use a diluted bath that will not bring out the image too quickly. In a negative that has been about correctly timed and fully developed the portions representing the whites or highlights should be nearly opaque but not quite

so.—Revue Photographique du Sud-est.

What is the Most Popular Angle? Some Statistics of the use of R. R. and Wide-angle Lenses

Curiosity led me recently to analyze 734 recorded exposures taken in a half-plate camera. It is a stand camera, which can be, and has been occasionally, also used as a hand camera. It is fitted with an $8\frac{3}{4}$ -inch R. R. and a moderately wide-angle lens of $6\frac{1}{2}$ -inch focus working up to f/11, both by a well-known maker, and, I should say, good specimens of their types. The single combination of either can be used separately, of course; though I find the half of the wide-angle gives better definition than that of the R. R. which answers well where a soft diffused focus is satisfactory and a small stop can be used. The exposures were on the various subjects that an irresponsible amateur takes, and were not specialized in any particular direction; hence,

the proportions are likely to hold good for the practice of most amateurs.

I found that-

The R. R. was used in 564 cases, or 77 per cent. The W. A. was used in 157 cases, or 21 per cent. The half of the R. R. in 7 cases, or about 1 per cent.

The half of the W. A. in 6 cases, or about 1

per cent.

The single combinations would have had more use had I been alive to their possibilities earlier. Further, I found that the stops used were

F/8, 191 times, or 26 per cent. of the whole number, or 33 per cent. of those where the R. R.

F/32, or smaller, with either lens, 122 times, or

12 per cent. of the whole number.

I was rather surprised to find the proportion of exposures at f/8 so high on a camera mainly used on the stand, especially as with an $8\frac{3}{4}$ -inch lens the depth of focus is not great. This led me to go through the record again to see if I could judge whether the use of a modern anastigmat of, say, f/6, would have often been an advantage. I had rather rejected the idea of investing in such a lens on the ground that such cases would have been too few to justify the expense. Again

I was surprised.

Leaving out doubtful cases, I found that in 137 examples (over 18 per cent. of the whole) an anastigmat would have been a distinct advantage -sixty-five of them for the sake of the increased aperture, which would have avoided slight under-exposure, or allowed a shorter exposure to avoid movement, and seventy-two where a greater area of good definition was wanted and would have been secured. This takes no account of the many unrecorded cases where no exposure was made for lack of a larger aperture, nor yet for thirty to forty exposures made in copying flat originals, some of them by artificial light, where much time would have been saved had I been able to secure sharpness all over with a large aperture.

Even on the ground of cost I should not have been so badly off. A convertible anastigmat of about 7-inch focus would have done practically all the work of my $6\frac{1}{2}$ -inch wide-angle, as well as the short exposures of the R. R.; while the long focus would have been supplied by its single components. It would have cost very little more than my two lenses cost when new; but, whereas the latter have depreciated in course of timejudging from the prices given in catalogues of second-hand apparatus—to less than one-third of their original cost, a good anastigmat would still be worth at least half of its first cost, and

probably more.

Even now I am tempted—well, perhaps after the war.—E. H. BINNEY, in Photography.

A Method of Mounting Film Negatives on a Glass Support

FILM negatives may be mounted onto a sheet of glass, so as to obtain a composite negative for photogravure printing and the like, by means of a solution of gelatin in glacial acetic acid, prepared by warming together equal weights of gelatin and acetic acid and stirring at intervals.

If too thick the solution should be thinned with acetic acid. A little of the solution should be applied to each corner of the film, and when tacky the film pressed into position on the glass. Within about half an hour the assembled negative will be ready for printing.—From Eastman Kodak Research Laboratory Report, No. 487.

About Focussing

To old photographers it may seem that all that could be said about focussing has been said over and over again, and this is, perhaps, true, but at the same time there are many young workers who are very weak in this operation, and who fail to get the best work out of an expensive lens through ignorance of its capabilities and limitations. We do not propose to deal with focussing by scale or depth of focus, but simply to give such instructions that will be helpful in ordinary studio and outdoor work.

The first point to be touched upon is the surface of the ground-glass, which is not always as satisfactory as it might be. If at all granular, it should be replaced by a finer sample. That known as "finely-ground patent plate" is the most suitable. Acid-etched glass has been most suitable. Acid-etched glass has been recommended, but the peculiar grain given by the etching does not seem so satisfactory as the mechanically ground. Before using, a little grease, say olive oil or vaseline, should be rubbed over the ground surface, as much as possible being polished off with tissue paper. This removes the white powdery appearance and makes the image much more easily visible. A focussing eye-piece or magnifier is a great help to most people, as it enables the operator to judge more accurately the degree of definition on various planes and to do so quickly. In studio work the desideratum is to work with as large an aperture as possible, which can only be effected by a careful study of the peculiarities of each type of lens. For example, a portrait lens and a modern rapid anastigmat require totally different handling when dealing with standing or sitting figures, the difference being due to the form of their respective fields. The young photographer who finds that he cannot get uniform definition cuts the knot by reducing the aperture of the lens. He thereby not only prolongs the exposure, but effects the quality of the image, which loses in plasticity when a small stop is used. When photographing a subject on one plane, such as a standing figure, the image produced by a portrait lens can be brought to uniform sharpness only upon a concave surface. As our plate is flat, we find either that the head and feet are sharp and the waist unsharp, or vice versa. Here there is nothing to be done but to stop down the lens, although, if the lens has sufficient covering power, a little improvement may be effected by lowering the rising front so as to bring the axis of the lens nearer the top of the picture, and swinging the back to bring the feet into focus. We have seen a satisfactory whole-plate fulllength produced in this way, when another photographer had failed to get a cabinet with the same lens. With a sitting figure the round field of the portrait lens is a positive advantage, as the head and knees, falling on different planes, come naturally into focus on the flat plate.

With anastigmats the case is different. Here we have even definition over a flat field, and the standing figure is perfectly rendered at full aperture, while the swing-back is needed to give satisfactory sharpness with a sitting pose. The side-swing may be used with either type of lens, but great discretion should be exercised in its use, as it naturally tends to make the perspective more sudden by bringing a nearer position of the subject into focus on a slightly larger scale. It is always advisable to focus at the aperture with which the exposure is to be made, not only on account of the possible presence of spherical aberration, but also that one is then certain as to the actual degree of definition which will be present in the negative.

In architectural work, indoor or outdoor, less skill is necessary in focussing, as objects at different distances have to be taken at the same time. and except with very small sizes, large apertures cannot be used. It is, however, very necessary to remember that many good rapid and wideangle rectilinears and symmetricals have a small amount of outstanding spherical aberration, which causes an alteration of the position of the image when the size of the diaphragm is altered. Hence, with such lenses, the final focussing must be done with the aperture which is to be used for exposure: with one exception, that of large rectilinears, in which the best results are sometimes obtained by focussing at f/16 and using either a larger or smaller aperture as may be desired for the actual exposure.

If a color screen or ray filter be used, it should always be put in position before the final focussing. If possible, such screens should be placed behind the lens instead of in front, as not only do they appear less likely to affect the definition, but there is less risk of their introducing internal

reflections.

Focussing upon clear glass is sometimes recommended, and for some scientific work, especially where the illumination is weak, it has its advantages. There is, however, always a danger of getting perfect definition on a plane different from that of the focussing screen, unless the precaution is taken of fixing a small piece of tinfoil or very thin black paper on the surface of the screen. If when the image appears to be in focus and, upon examining through an eyepiece, it also appears stationary with regard to the edge of the paper when the magnifier is moved up and down, the image will not be in focus upon the plate.

It may be asked why all this trouble should be taken to focus at a large aperture when the same result can be obtained by stopping down. To this we can only say that if only one larger-sized aperture be used, a 250 H. and D. plate becomes equal to a 500 H. and D., and if such a plate exists, a 500 becomes 1000, with no deterioration

of quality.

One necessary preliminary to the use of large apertures is a careful testing for coincidence of the register of the focussing screen and dark slide. This is easily done with the aid of a stout lath with an ordinary screw fixed in the center, used as a depth gauge on both the focussing screen and a plate *in situ* in the dark slide.—*British Journal of Photography*.

Waterproof Dark-room Benches

It is almost impossible to keep dark-room benches and shelves from getting splashed with chemicals. No serious harm may be done if the woodwork is frequently washed down; but if the splashes are allowed to dry the salts will crystalize out and be blown about the room in the form of fine dust. Particles will settle on wet negatives and prints, and the resulting spottiness will, very likely, be attributed to faults in the sensitive material or impurities in the developer.

The whole trouble can be avoided by making the benches and shelves waterproof, so that splashes may be wiped off without any of the liquid having been soaked up by the wood. A very good plan is to melt some paraffin wax by gentle heat, pour it on the wood, and work it in with a flat-iron just warm enough to melt the

wax.

Varnishes which answer the same purpose may be made by dissolving bitumen in either benzole or turpentine, or by dissolving either shellac or sealing wax in methylated spirit. Whether the paraffin wax or one of these varnishes is used, however, it is essential that the wood should be clean and dry before it is applied. If there is any doubt about the surface being clean, it should be planed or rubbed down with sand-paper.—The Professional Photographer.

A Developing Tip

A correspondent in the Amateur Photographer states that he finds it a good plan when developing both contact prints and enlargements to soak the print in water for several minutes before development, especially with large enlargements, in order to get an even flow of the developer over the whole surface of the paper. It is also advisable to use a dilute developer, and as soon as the picture begins to appear to immerse the print in plain water. The print saturated in developer will gradually build up until the whole picture can be seen; it is afterward transferred back to the developer until the required depth is obtained, and then fixed and washed as usual. This is sometimes helpful with over-exposed prints and enlargements.

Fixing and Washing

WE get many queries with regard to troubles on negatives or prints, the cause of which in the great majority of cases is nothing but imperfect fixing. As a rule, the defect appears in some after-process, such as toning or intensifying, which fact is alone enough to suggest the cause, most of these processes forming delicate tests for perfect fixing. Our correspondents generally lay stress on the care with which they have washed the results, but never do they give any details of the fixing operation, from which we may conclude that most workers still place undue importance on washing, and ignore the even greater importance of perfect fixing. With respect to these two operations there seems to be a great deal of confused thought, thorough washing having been made into a sort of fetish by carefully precise experimenters, who have not been careful enough to consider the matter of fixing at all. Imperfect fixing means that we leave in the film unstable silver and sulphur compounds that cannot be removed by any amount of washing, and are liable to change color in course of time or to react with toners or intensifiers. On the other hand, perfect fixing, followed by washing that is not quite complete, simply means that a very small trace of hypo alone is left in the film, which by itself can do little or no harm, and will react only with some of the solutions that may be after-

ward applied.

In point of fact, it is doubtful if washing can ever be quite perfect with any type of gelatin emulsion, for sufficiently delicate tests will reveal the presence of hypo in extremely minute quantities after even very prolonged and careful washing, but there is no evidence that this slight trace does any harm. On the other hand, a very brief washing conducted carefully will remove such a large proportion of the hypo that the small amount left becomes very difficult to detect. A glass negative can be freed of hypo to this extent in a very few minutes, though a print takes rather longer, owing to the fact that the paper as well as the gelatin has to be cleared. We are much inclined to think that both negatives and prints are often over-washed by many workers, and that, especially with prints, the oversoaking in water is more likely to have a detrimental effect than the presence of a very

minute trace of hypo.

There is no doubt whatever as to the evil effects of incomplete fixing, for the smallest trace of silver thiosulphate compounds is capable of producing very obvious stain. The special difficulty in the fixing operation is that there are several varieties of silver thiosulphate, insoluble and soluble, and the soluble varieties are only produced in the presence of a sufficient quantity of hypo bath. Plenty of hypo is therefore the remedy, and we must give it time to do its work properly. Imperfect fixing may be due to not allowing enough time, not allowing enough fixing bath, or to using an old bath that is nearly exhausted as regards its fixing properties. All three are common faults, especially the last one, but the matter of time is probably a somewhat frequent cause of trouble in cold weather, when the fixer acts very slowly. If the bath is either too weak or too strong its action is very slow at a low temperature, hence it is important either to keep the temperature up to normal or else to prolong the time. The actual times depend a good deal on the emulsion, but if we consider the case of fixing an ordinary negative on an average fast plate, a drop of temperature from 65° to 55° F. will require about double the time of fixing. A further drop to near 45° F. will probably more than double the time again, so that if we use a 20 per cent. bath, which requires only about six to eight minutes at 65° it will want about half an hour at a temperature about 45° to be on the safe side. It is, however, not uncommon for careless workers to use a bath at about 40° or thereabouts, and to give only a little more than ordinary time for fixing, though perfect action probably demands an hour or so. There is also an impression among some workers

that a long immersion in the hypo bath is detrimental to the film. We, however, know of no evidence that will support this idea, provided that the film is completely immersed in the solution. Contact with air will do damage in the way of fading or reduction of density, but immersion guards against this, and mere soaking in hypo is, we believe, not at all detrimental.

Long soaking in water will certainly damage the gelatin, for the latter becomes soft and partly decomposed. Soaking in hypo solution is, however, not the same thing as soaking in water, for the solution does not wet the gelatin to anything like the same extent; on the contrary, it takes water from the gelatin, and so tends to make it less wet. If we make a stiff gelatin jelly, and soak it in water, it will swell. If we soak it in even very weak hypo, say, 5 per cent., it will shrink, while if we soak it in very strong hypo, say, 50 per cent. or over, it will contract so violently as to crack and break up into small pieces. A very little hypo indeed will cause shrinking, and therefore solutions of from 20 to 40 per cent., which are commonly used for fixing, instead of wetting the film like water, tend to reduce it to a drier condition. It may be safely asserted that an hour in the fixing-bath will do no harm to either a negative or bromide print, while over an hour's washing in plain water may do damage in warm weather. If care is taken, half an hour should be sufficient for washing

When cold causes the fixer to act slowly, it is best to strengthen the bath. The quickest acting bath is one of 40 per cent., and this may be used at all times for negatives, and even for prints when the temperature is down. For ordinary use in the summer 30 per cent. is a good strength. Baths over 40 per cent. act slowly on account of their drying action on the gelatin. The fault of using too little bath is common only among amateurs working on a small scale. If fresh bath is used for every plate or print, a very small quantity will suffice, but though 2 ounces may be enough for one quarter-plate negative, if the same bath is used for a halfdozen plates the last ones stand a good chance of being imperfectly fixed. The same thing holds good in proportion when we are using hypo bath by the gallon instead of the ounce, and many workers persistently overwork the fixer, with the result that trouble occurs periodically in the case of the last work carried out with the old bath. Imperfect fixing from this cause may be guarded against by always having the fresh bath available through which the work can be passed after the main bulk of the fixing has been done by the older bath. It is an excellent thing to adopt the system of always using two fixing baths in succession, the second one being quite fresh, while the first is not more than a day old. The second bath for the one day then comes into use as the first bath for the next day.

In the case of prints, imperfect fixing may result from the formation of air bells on the film or from prints sticking together in the bath. Such mishaps cannot occur except as the result of neglect, for no one with any experience of photography can expect prints to fix safely by themselves without frequent attention and stirring up or movement. They cannot even be left to wash by themselves with any security, and if good results are to be ensured every worker must be prepared to give personal attention to

the processes of fixing and washing.

In regard to washing, the spectacle of rapid running water, with prints flying widely around the washing vessel, is very fascinating, but often very deceptive. A lot of the water that runs into the dish or tank runs out again without ever coming near a print or plate, and without carrying off any hypo, while some of the hypo that has diffused out of the films remains in the vessel all the time, simply circulating round and round in eddies. At the end of an hour some lucky films may be quite freed from hypo, while others have simply been soaking in weak hypo all the time, and are still unwashed. Some washers are better than others, but the ideal system of washing, whether conducted by hand or mechanically, involves repeated soakings in still water, alternating with complete changes of water. The principle of soaking is easy to understand, and it is only necessary to understand it to appreciate the benefits of soaking. Take, for example, a negative fixed in a 30 per cent. hypo bath. On removal from the fixer the film retains a certain small amount of hypo. say, half a dram of 30 per cent. hypo. Put the plate to soak in 10 ounces of water, and the hypo promptly diffuses out of the film into the water. If the diffusion is continued as far as it will go, the plate when removed will carry out only half a dram of about ½ per cent. hypo solution, instead of 30 per cent., so that the strength of the hypo is reduced to about $\frac{1}{150}$ of its original strength. A second soaking carried out in the same way will again reduce the strength to $\frac{1}{150}$ of $\frac{1}{5}$ per cent., so that the amount contained in half a dram of solution is very minute indeed. The soakings must be fairly long ones to produce such an effect with only a few changes of water, but by making the soakings shorter and the changes more frequent we can hurry up the process. Moreover, a rinse under the tap be-tween each change will remove all the surface hypo solution clinging to the film and further hasten matters. We may consider that six soakings, each for a period of two or three minutes in a rocking dish, will free any negative from all the hypo that matters, so that by giving attention to the work we can wash a negative as perfectly as can be desired in twenty minutes. Something depends on the water, and rain-water will generally act more rapidly than hard tap water. Using distilled water, we have found it possible virtually to free a negative from hypo in less than ten minutes.

A good method of testing a plate-washer is to charge it with some negatives all heavily stained with a strong solution of potassium bichromate. If all are quite free of stain in twenty minutes, the washer is a pretty good one. A similar test may be used for a print-washer, and all we have said with regard to the washing of plates applies equally well to the washing of prints, with the proviso that more changes are required to free the paper as well as the gelatin from the absorbed hypo solution.—British Journal of Photography.

Straining Prints

Mounting photographs on strainers covered with canvas is not quite as simple as it appears to be, and requires a good deal of practice to carry out successfully. Even trade mounters do not always succeed in mounting a large sheet well, as many architects have discovered to their great annoyance, and when no risk is to be incurred it is generally better not to "mount," but to "strain" the sheet just in the same way as draughtsmen sometimes strain paper onto a drawing board. The straining operation is quite simple, and a tyro can do it well at his first attempt. Damp the drawing or print all over, and when quite moist stretch it slightly lengthwise and sidewise as well, taking care to stretch it equally so that it will be quite flat. Then lay it down on the strainer face up, and turn up the edges for half an inch, or an inch, according to the size of the print, all around. Run an edging of strong hot glue all round the turned-up edges, and then rapidly rub them down onto the strainer. Put the strainer away to dry, leaving it in a perfectly horizontal position, and on no account standing it up on edge. When dry the print will be found to be strained as tight as a drum-head, and nothing but excessive damp will ever cause it to buckle. The glue must, of course, set before the paper dries, otherwise the glue joint will separate. It is therefore as well slightly to moisten the center of the print now and then during the first hour or two. method is naturally not suited to thin paper, but large prints are usually made on thick paper quite strong enough to stand the strain.—British Journal of Photography.

A Modern Wet-plate Formula

THE wet collodion process as generally used by photo-engravers today differs very little from that introduced by Scott Archer in the early fifties of last century, and up to 1880 it was the only means usable for producing photographic negatives from nature (portrait or landscape).

negatives from nature (portrait or landscape).

After Scott Archer, Hardwick spent much time and skill in determining the best formula for compounding the iodized collodion so that the utmost gradations of tone values would be produced in the negative, with the necessary vigor to ensure due registration in the positive print. Experience and research settled the collodion formula at:

Pyrocylin	е	,		,	8 gr.
Sodide					4 gm.
Bromide					1 gr.
Alcohol					$\frac{1}{2}$ OZ.
Ether					$\frac{1}{2}$ OZ.

The glass plate coated with such a collodion was sensitized in a solution of silver nitrate (40 grains) to each ounce of water, and after exposure in the camera the latent image was developed by means of a solution of protosulphate of iron, 20.25 grains acetic acid 15 to 20 minims to each ounce of water.

These formulæ represent almost the final absolute standard for producing the highest

grade of continuous tone negatives, and when photo-engraving was first born so many new and perplexing problems had to be solved, optical and mechanical, that precluded much worry as to any possible improvement in the old wetplate method of working which seemed to be consecrated by a photographic lifetime or efficiency, and so we let it go at that.

But an experience recorded in these plates last year gave real cause to doubt that the oldestablished formula was really the best possible for making negatives suitable for photo-engraving, and further experiments prove that the following modification will give far better results

and also be more economical.

Take one pint of either Mawson's, Penrose's or Johnson's collodion (iodized as directed by each maker). To this add 10 ounces of methyl ether and 10 ounces of industrial spirit, or one pint of thinning solution as sold by each maker for the purpose of thinning collodion, which has thickened somewhat from the operators' boyish habit of losing the cork or stopper out of the collodion pourer. After the above addition shake up well, then let it stand overnight to settle. The film will be a little more tender perhaps, but that is of no moment practically. The silver bath need not be over 25 grams per ounce of water. This will give a good working strength, but will not feed the dark-room floor so generously as does the stronger 30- to 40-grain solution.

For the developer make up a stock solution of commercial sulphate of iron (green copperas). This gives far better results than the nicerlooking crystals of protosulphate of iron.

To make this stock solution, dissolve 3 lbs. of commercial sulphate of iron in 80 ozs. of hot water. When cold add 5 oz. liquor ammmonia. Stir well, then allow to settle. This solution

keeps well and improves with age.

Acetic acid being scarce, we now require another stock solution, first introduced in the seventies of last century by M. Carey Lea, and which is both cheaper and better than acetic acid, especially in the directions of giving clear lines, and more density, both of which advantages in process work were against its use for continuous tone negatives. M. Carey Lea called the preparation collocine.

To make this collocine, carefully add one ounce of sulphuric acid to ten ounces of water, then soak one ounce of gelatin in water till it is quite soft, squeeze as much of the water out of the gelatin as possible, then dissolve in the mixture of water and sulphuric acid. Next put in a few nails or scraps of zinc, and let this act for twenty-four hours or so, stirring up at intervals. Finally dilute to twenty ounces and add 30 grains of soda acetate and label collocine.

Now we are ready to make up our developer, which is done in a few seconds and without having to hunt up the weights, probably lately

used as lethal projectiles. Take of

Stock s	olut	ion	of	sul	ohat	te o	f ir	on	6 oz.
Stock s	olut	ion	of	coll	ocir	ie			1 oz.
Water									80 oz.

This developer acts a little slower than the ordinary developer (but is not unduly slow) and gives a richer image.

Fix (or clear) in a solution of hyposulphate of soda 16 ounces to a quart of water. Keeping disk outside the dark-room.

Negatives made by this formula require very little clearing, because the film is so thin that surface fog has no tendency to form like it does with a thick film.

Mr. Smith's clearing solution is the best made

up as follows:

			Α		
Water					25 oz.
	sulphate				1 oz.
Sodium	chloride	9			1 oz.

Ordinary table salt answers well in my hands. When dissolved add sufficient liquor ammonia (0.880) till the solution is quite clear, and a rich ultramarine color.

В

Hyposul	phi	te o	f so	da		5	oz.
Water						25	oz.

This should be made specially for this purpose, not dipped out of the fixing bath.

For use as a clearer or reducer take equal

parts of A and B.

To intensify, use the ordinary lead and ferricyanide formula, followed by sodium and ammonia sulphide. The thinner collodion film scores again here, as with it no acetic acid is necessary in the lead solution.—W. T. WILKINSON, in *The Process Monthly*.

A Permanent Developer for Tank Use

With the present necessity for economizing in all directions on photographers' equipment, a satisfactory developer which does not wear out, and which consequently need not be thrown away after use, is an important addition to any dark-room, particularly where a good number of plates are to be developed.

The developer in question is used largely in the United States, and having personally tested it the writer can recommend it for all ordinary

work.

For some time now the tank system of development has steadily gained in favor, and there are probably few photographers at the present day who do not, at least part of the time, make use of it. The writer long since discarded every other means of handling plates.

Consequently a developing solution which can be filled into the tank and retained for practically an indefinite period, is of great assistance both in the economy of the time necessary for making up solutions and the materials for doing so. Provided a regular plate tank has already been in use, no further apparatus is necessary; but failing this, some kind of flat tank with a simple carrier to hold as many plates as may be required—say half a dozen—must be prepared.

This can best be made of tin plate, and if access can be had to some electro-plating establishment it can be given a heavy coat of nickel. This cannot be improved upon, but failing this, the tank can be given two coats of asphaltum inside, which will make it impervious

to any chemical solution. It is very important that this be done, as some of the chemicals used will have a slow but sure action on solder, and while this would be unnoticed in a solution which was only in the tank for an hour, where it is in for weeks on end the amount of impurities absorbed would have a disastrous effect on the results.

The following is the developing solution:

Pyro	10 oz.	(87 gr.)
Sodium sulphite	6 oz.	(175 gr.)
Sodium bisulphite	$1\frac{1}{2}$ oz.	
Sodium carbonate	2 oz.	
Potassium iodide	5 oz.	
Water up to	1 gal.	

Dissolve the sulphite in one quart of hot water, add the bisulphite, then boil the solution for five minutes. Cool down to 70° F., and add the pyro. Next dissolve the carbonate in one pint of warm water, and then add the iodide. Put these two solutions into the tank and make up to one gallon of water. Develop normal negatives for eighteen minutes, at 65° F. Fix in the usual way.

In order to make up in wastage from the tank, the following solution should be mixed up and

kept in a closely stoppered bottle:

Pyro	$\frac{1}{4}$ OZ.
Sodium sulphite	1 oz. (150 gr.)
Sodium bisulphite	150 gr.
Sodium carbonate	3 oz. (50 gr.)
Potassium iodide	4 gr.
Water up to	60 oz.

This should be added to the main solution in the tank as required from time to time.

The negatives developed in this are at least as good as in pyro-soda developed plates, and for almost any purpose will be found to give good results.

It is of great importance, however, that the solutions should be prepared with accuracy, in accordance with the formulæ.—Amateur Pho-

tographer.

Copying with Mirror

It is sometimes necessary to copy architects' and engineers' drawings and working plans so quickly as to render the making of a negative out of the question, on account of the delay in drying before a positive can be produced. Assuming that a right-way-up copy is wanted, and that reversal as to black and white is immaterial for the working details, the best way is to use a suitable prism on front of lens. But this is a very expensive piece of apparatus, and therefore prohibitory unless a large quantity of work of this kind is contemplated. My plan was to make a light box, $4\frac{1}{2}$ in. every way, and to insert at an angle of 45 degrees a piece of good looking glass. The end of box opposite sloping mirror has a hole so as to fit on lens hood, and the side of box, where lower edge of mirror comes, is hinged freely to open for exposure, with snapcatch to close. Exposure is made on bromide paper, and the print is ready almost as soon as developed. The plan is, of course, applicable to obtaining fac-simile of handwriting, legal documents, etc., and copies can be multiplied indefinitely. Should positives be required, the first print can be put where the original was situated if of same size, but in this class of work it is seldom necessary. The benefit is a right-way-up print with the least delay, little requisite space for storing, and no broken negatives. Of course, the box must be made light-tight.—Amateur Photographer.

The Straight Print and Technic

WE were told not long ago by a certain manufacturer who used photography extensively in his advertising that, with the exception of a few well-known firms who specialized, it was an extremely difficult matter to find photographers who could make good straight photographs of technical excellence combined with pictorial quality.

The remarkable and unique qualities of photography in its exact power of rendering tone, texture, and detail—qualities that no other graphic art possesses—are frequently overlooked

in the desire for breadth, etc.

We frequently hear from readers who ask us why so few pictorial results are secured by straight photography, and so many are exhibited in the "control" processes. Our reply is that, provided the photographer has the eye of an artist and complete control over his photographic apparatus, coupled with full knowledge of its limitations, there is no reason why results unassailable from the pictorial point of view should not be secured in technically perfect straight prints. Unfortunately, however, workers with this desirable knowledge are not numerous, and the line of least resistance, *i. e.*, making the best of the subject at the moment of seeing it, and trusting to control processes later to "pull the picture together," is the one most frequently chosen.

Very few workers realize the claim that the straight photograph makes, being under the impression that "control" or "modification" in some way is essential if the final result is to possess any artistic merit. This is certainly not the case. Many of the effects of nature that the pictorialist wishes to portray or express with feeling in his picture are quite possible with a straight picture, provided that the worker understands the use of his tools and materials, and uses them at the right time from the right

view-point.

If it were realized how much could be done by means of good straight technic, we should not hear so much about "control" or "modification" required in order to produce a pictorial result. Let us take an example. We are told that in landscape work, for instance, the subject requires to be "emphasized" and the straight

photograph cannot do this.

Those who hold this view are invited to suspend their judgment until they have tried the use of a lens of fairly long focus, realized the power of selective focussing, and the merits of a panchromatic, or even an orthochromatic plate with a suitable screen, and they will find that this will give the required emphasis, and in any direction needed. In other words, to appre-

ciate what straight photography can do, we require a full knowledge of technic.

To press this point still further home, we generally find that those who are the most insistent upon hand work are those who use small cameras fitted with short-focus lenses, including far too wide an angle for pictorial purposes, and also allowing very little power of differential focussing, who do, of course, have to modify the enlargements from their too all-over-sharp negatives, in order to "emphasize" the value of the subject.

While appreciating to the full the value of the present-day small camera and semi-automatic methods of enlarging in many fields of work widely separated from the artistic aspect, we must admit that this is not the ideal when viewed from the technical requirements of the pictorial worker, and at the same time we must confess there was a great charm in the old direct wholeplate or 10×8 work, by which so many of our pictorialists educated themselves, artistically and technically, and produced their master-pieces. It is certain that though not at the present time popular, it is one of the soundest methods of producing careful work.

Of course, we must admit that in some cases, or through technical reasons, a straight photograph is not possible, as in the case of a sunset sky requiring a brief exposure, and heavy foreground objects that demand very much longer to impress their details on the plate; but even here much can be done by means of an orthochromatic plate and a graduated filter.

Then again we fully realize that the "straight" worker is often limited as regards his subjects by reason of outside elements intruding that the exercise of a certain amount of "control" would eliminate or suppress from their insistent position in the picture; moreover it is possibly easier to make up a picture from two or three indifferent negatives, containing all their strong points and none of their faults, than it is to find such a picture in nature and take it direct in its entirety. And in this case it must be the eye of the artist, open to see, that will be the determining factor toward success. This class of picture must depend for its ultimate value upon the technic that its author is capable of endowing it with; but this kind of subject is certain to evoke a very real satisfaction in the minds of those who, at the risk of being rather old-fashioned and designated "purists," appreciate a good clean technical and pictorial photograph direct from the camera.

While we appreciate all the virtues of straight photography, we admit that there are times when control or modification of the result is an essential, owing to the limitations of our medium, and it must not be thought that we are in any way opposed to this when the above is actually the case. What we would point out is that by care and attention to technic much of the control at present exercised would not be needed, and it is with the object of emphasizing the beauty and advantages of the straight print that these notes are penned. When all that is possible in the way of technic has been done, and there is still something lacking, modification may be proceeded with.—Amateur Photographer.

Home-made Sensitized Postcards

The production of home-made sensitized papers has always a fascination for certain amateurs, and in these days of strict economy the following notes on the making of sensitized postcards of good printing quality will appeal to many.

First of all, take plain postcards and give them a "surface" by floating each for about five minutes on a bath consisting of 100 gr. gelatin dissolved in 4 oz. of water. This may be used a good many times by simply leaving it in a vessel when finished with, and then melting it by standing the vessel in hot water when it is wanted again.

Drain each postcard carefully, and then dry on blotting paper in a warm place. The top of the kitchen range is a good place, if care is taken to prevent dust or other foreign matter settling on the cards.

While the cards are drying, prepare the following salting solution:

16 gr. 2 oz.

4 gr. Now float each postcard on this bath for five

minutes, and dry again as before. The cards are now ready for sensitizing. The

sensitizing bath is prepared by dissolving 60 gr. of silver nitrate in 1 oz. of water. A "brush" for applying this solution must also be prepared as follows: Take a glass plate and fasten over one end of it a piece of lint (not boracic lint), so that the edge is level and smooth. Take a dry postcard, place it, "salted" side up, on a sheet of blotting paper, and brush over it the silver nitrate solution with bold sweeping strokes in all directions, using the edge of the "brush," until the postcard is evenly covered. This should be done in artificial light. Then allow the card to dry in a dark place.

This sensitizing solution will be enough for about three dozen postcards, but it must be mentioned that it should be kept away from the skin, as it stains very easily.

The gelatin is at present about 10c. an ounce, ammonium chloride is 1c. an ounce, and silver nitrate costs, as far as I know, about \$1 an ounce, so that the cost of preparing three dozen postcards, which can be done in one night if two baths of each solution are employed, would be approximately as below:

3 dozen plain postcards 60 gr. silver nitrate 48 gr. gelatin 16 gr. ammonium chloride	1c.
Total for 3 dozen postcards	20c.
Total for 1 dozen	6c.

The cards are printed, toned, and fixed in the usual way.—Amateur Photographer.

Improved Bromide Prints

If a bromide print is seriously defective in any way the best plan is to scrap it and make another; but there is one fault that can be properly dealt with, and with bromide paper at its present price the operation is really worth while.

It sometimes happens that a print has plenty of detail, but is too weak. It may have been a little under-exposed, so that it will not develop up to sufficient strength, or (as happens with some papers) it may have lost considerable vigor in the fixing bath. Perhaps the negative was rather flat and weak, or the subject itself lacking in contrast and life. Or, again, the developer may have been overworked, and in this case the print which it will give is probably

In all these instances it is an easy matter to brighten and strengthen the print satisfactorily, and also to secure an image of good color. Rather than deal with a single print, it is better to wait until about half a dozen are ready for treatment, and then to deal with the whole batch of them

at a time, and by daylight.

While the prints are soaking in clean water the following bath is prepared: One hundred grains of potassium bichromate are crushed into powder and dissolved in 10 ounces of water; 50 minims of hydrochloric acid, of the "commercially pure" standard, are then added. One of the soaked prints is placed in a dish, the bichromate solution poured over, and the dish constantly rocked. Almost at once the silver image will begin to change color, and in a few minutes it should be completely turned to a yellowish tone. No trace of black or gray must remain anywhere. If the action hangs fire at all, the solution should be poured off and a few more drops of acid added to it before pouring it back to accelerate its action.

As each print is thoroughly "bleached" it should be transferred to a dish of clean water. Washing, by means of several changes of the prints into fresh water, must be continued until the yellow stain has entirely disappeared from the paper itself, although the image will still be faintly but distinctly visible on the print.

The prints are next redeveloped one by one, with a solution of the amidol type, or any of the usual agents for developing bromide for black tones. This process should be carried as far as it will go, and may be continued for some little time after the action has apparently ceased. A short but thorough washing completes the operation, and the prints when dry will be found to have gained very considerably, in brightness and strength. The effect is not exactly the same with all papers, nor with all developers, but in every case there should be a marked improvement.—W. L. F. Wastell, in Journal of Photographic Society of India.

Modelling

When a retoucher has filled in the wrinkles and removed the freckles and blotches, he sometimes finds that the negative is just a little on the flat side, and that the high-lights need strengthening to give the necessary sparkle to the portrait. It is just at this stage that the careless or inexperienced worker is almost certain to destroy the likeness. He sets about "tipping the high-lights," as he terms it, without realizing that every touch he puts on may have a serious

effect upon the modelling of the face. He doesn't grasp the fact that the modelling, far more than the outline, conveys the form of an object.

A flat negative can be improved, of course, by strengthening the high-lights; but this cannot be done by putting on the work in a haphazard fashion. It is not enough to put a few rough dabs of color on the back of the negative over the forehead, the cheeks and the chin. Indefinite patches of light are not modelling. High-lights have clearly defined shapes and positions, which vary, of course, with the contours of each face. They are not woolly blobs, but clean-cut patches—patches that are not flat, but so delicately graded that in a good negative they show, even within themselves, subtle half-

tones and smaller high-lights.

When a negative is on the flat side, it is always safer to strengthen the high-lights before the face is smoothed up, because otherwise the modelling will be almost lost in the general retouching and the difficulties thereby greatly increased. Care should be taken not to make the tips of light too strong or too large; and it should be remembered that there's generally a high-light within a high-light. It is important, too, to bear in mind that high-lights have not all the the same value. The one on the forehead will be stronger than those on the cheeks and the chin unless, of course, some fancy method of lighting has been used.—Professional Photographer.

The Sensitometry of Roentgenographic Materials1

The measurement of the sensitiveness of materials used in ordinary light photography has already been reduced to a more or less exact science. In the system of photographic sensitometry developed by Hurter and Driffield, the important photographic constants may be expressed numerically with but little difficulty. It has been realized by investigators in roentgen materials that the following factors could be investigated precisely and mathematically:

(a) Sensitiveness or speed.

(b) Contrast.

(c) Relation between sensitiveness, contrast, and wave-length of x-rays.

(d) Development characteristics. (e) Fluorescent screen efficiency.

The chief obstacle to making accurate sensitometer exposures to x-rays lies in the difficulty of making consecutive exposures accurately. In white light and sensitometry, a simple rotating opaque sectored disk, with the openings proportional to the progression of exposures, may be interposed between the light-source and the plate and a series of exposures obtained simply and accurately. With the available roentgen equipment such procedure is impossible. The current furnished to operate the tube efficiently is pulsating, with the maximum frequency usually 60 cycles per second. Therefore, by interposing the rotating sectored disk in front of the tube operated by such pulsating current more or less synchronism occurs and grave errors follow. The

¹ Communication No. 63 from the Eastman Kodak Research Laboratory.

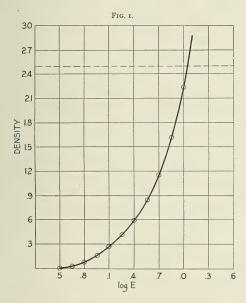
most feasible method of working is by moving the plate itself by intermittent motion across the path of the roentgen-ray beam in such manner that a known progression of exposures is given, controlled to the desired accuracy.

In the sensitometer adopted for the present work, the photographic plate is moved in this manner, the length of the exposure steps being controlled by an actuating electromagnetic

mechanism.

For the study of roentgen emulsions it was found most convenient to use an exposure progression of consecutive powers of the square root of two. The roentgen-tube circuit was connected to a solenoid switch, this switch being operated at the proper time by the sensitometer mechanism. The entire operation of exposure was thus governed to within an error of 3 per cent.

In plotting the density values of the resultant exposure strips, no absolute values are assigned to the points along the abscissæ, the curve being



located merely by the known progression of exposures given assuming an arbitrary exposure unit. The illustration shows such a characteristic curve of the plate (Seed x-ray), obtained under the following conditions:

Tube-Medium focus Coolidge, 3-inch dia-

phragm stop. Voltage—Ca 50,000.

Development—Five minutes at 70°, Elon-Hydrochinon formula.

It will be noticed that the type of curve is somewhat different from that usually obtained The maximum from white light exposure. density is beyond any which is optically measurable, even with the most intense light-source, the curve sweeping in a close approximation to a parabola, until a density of 5.0 or more is reached.

For average roentgenographic research, however, the portion of the curve to be considered

is only that limited by such a density as can be seen through the average viewing frame. This

is a density of about 2.5.

The method has been applied for the study of variation in the photographic effect of varying hardnesses or wave-lengths of x-rays. With the present types of x-ray emulsions the characteristic density exposure curve has been found to increase in slope or contrast with the softness of the tube; that is, with an increase in wavelengths. The rendering power of the plate from these latter curves has been found to depend both upon the plate itself and the tube hardness. The method presents an accurate means for the measurement of intensifying screen efficiency.-MILLARD B. HODGSON.

A Convenient Rule for Focussing

THE commercial photographer and often the portrait photographer who does odd jobs of commercial work is sometimes required to photograph a small object of considerable depth in fairly large proportions. It seems a simple thing until the negative is made and a part of the object is found to be out of focus.

The exact plane to focus upon to insure the front and back of the object being in focus at the same time can be determined quickly by a very simple rule. The exact size of the stop necessary to give the proper depth of focus can also be estimated but not by so simple a rule.

Once the exact plane to focus upon has been determined, however, this plane can be focussed as sharply as is possible and by trial the stop can be reduced until the front of the object is in perfect focus. The back of the object will also be found to be equally sharp and a good negative can be secured on the first trial if the exposure is correct.

It is generally understood that the plane on which it is necessary to focus in order to have the front and back of the object sharp at the same time is not half-way between the two as is often assumed by an inexperienced worker. It is only a very short distance behind the front of

the object.

Knowing the distances of the front and back of the object from the lens the plane on which to focus is twice their product divided by their sum. For example, the front of the object is 3 feet from the lens and the back of the object 5 feet from the lens, thus, twice 3 times 5 divided by 3 plus 5 equals 3 feet and 9 inches, or 2 x 3 x 5

 $=3\frac{3}{4}$, so that the plane to focus upon would be $3\frac{3}{4}$ feet from the lens or only 9 inches beyond

the front of the object.

This rule is simplicity itself and should be useful in many cases. By a more complicated rule the exact diameter of stop necessary to give sufficient depth of focus in such a case can be determined. But once the correct point to focus upon has been determined most workers will prefer to find the correct stop by trial.

A very satisfactory method both for securing the correct focus and the stop that will give sufficient depth is as follows: Having determined that 9 inches beyond the front of the

object is the correct plane for focussing, place a piece of good black and white printed matter in a small printing frame and set it up at this point. When it has been focussed, sharply set it up at the exact front line of the object and stop down until this is also sharp. If the stop necessary is so small that there is not sufficient illumination to determine whether or not the front of the object is sharp, a strong light can be thrown on the printing frame or the lamp itself placed in position where sharpness can be determined by the image of its filament on the ground glass.

The stop must be reduced until the front of the object is sharp when the back of the object will also be sharp. Without the calculation for determining the plane on which to focus-if the plane is merely guessed at—the front of the object may be sharp and the back out of focus or the back sharp and the front out of focus. In either case a smaller stop would have to be used than is necessary when the rule given above

is used.—Photo Digest.

Improvement of Negatives by Means of Methylated Spirits

I HAVE for a considerable number of months been using methylated spirits for the removal of irregularities—such as false lights in the eyes. hair markings (black in negative), and other variations which occasionally crop up to vex the operator (or retoucher) who wishes to turn out a perfect negative—one which will require the minimum amount of spotting.

During the winter months, when the light is weak and the operator has to admit all the light possible without being too particular whether it strikes the sitter or sitters to the greatest advantage, there will occur false lights in the eyes, and this more particularly so in the case of groups. These are easily, simply, and safely removed and reduced to the proper depth in the

following manner

Take any suitable piece of fine wood (I use the handle of a worn-out sable brush) and scrape it down to a fine point, dip it into a small bottle of methylated spirits and rub it on the point to be reduced with a circular motion. Keep the point of this wooden stylus well moistened with the spirit, and a few touches achieve the required result. Should a deposit be left on the surface of the film it is easily removed with a pledget of fine cotton-wool slightly damped with spirit. For broader patches almost any means may be taken to apply the spirit—I have found a chamois leather stump very effective and convenient, and it also has the advantage of being useful as long as there is a trace of the damp spirit left on it. I have successfully applied the spirit by means of a pencil of shoe sole leather, obtainable from any shoemaker or boot repairing shop without cost. By paring it to a chisel-shaped point and using the diagonal or bevelled flat surface it reduces the film very evenly and sweetly. In introducing artificial clouds on a negative you can give just the last realistic touch by using the spirit-damped stump to give just a sensation of a shadow on the lower side in diagonal juxtaposition to the highest light; but don't overdo it, as the smallest suggestion of shadow is usually

quite effective, and if tastefully done yields no suggestion of faking. For improving landscape negatives it is simply invaluable, adding depth and giving vigor to the foliage, trees, sky, or foreground, giving just that appearance of pluck which redeems it from all traces of flatness, and is applicable to the finest lines or the broadest masses. For removing those fine black hair markings which sometimes occur—usually on the most important negatives—it is only a minute's work to obliterate it with a fine point, and nothing more is left except sometimes a semitransparent line, which is easily retouched to the level of the adjacent parts of the film. It requires almost no skill and only the necessary judgment to observe when the density level is reached, and to less-experienced workers is much safer in result that the use of the knife, which requires much more deftness and practice. When copying busts from a group where faces come in front of the figure to be copied, it is fairly easy by means of abrasion with spirit to reduce the objectionable light objects, retouching to strengthen the shadow parts, having recourse to the use of Billdup and Billdup black on the glass side of the negative to obtain a suitable and even background, light or dark, as required; or by the spirit-dipped stylus, straight lines or ornamental touches can be added to any background when it is felt that a negative can be improved thereby. A softer point than that of cedarwood is sometimes desirable, and that may be obtained by trimming the wood of an ordinary match to a sharp point and fitting it into the holder of a retouching pencil. Used thus the fibers at the point separate themselves, and form a short brush, which is very smooth and easy to work with. I do not like to alter a good negative more than is absolutely necessary, but it is very convenient when desirable alterations can be so simply and effectively accomplished. I have just now tried the same procedure on a bromide print, but it seems to be only partially successfulprobably owing to a certain proportion of the emulsion having been absorbed by the paper on which it was coated. It ought, however, to act all right on baryta-coated papers on which bromide prints have been made.—R. C. PLATT, in British Journal of Photography.

Forty Ways to Spoil a Picture

1. The camera or holder may leak light, and "fog" ensue.
2. The dark-room may not be entirely tight,

3. "Fog" on a sensitive plate, owing to too much light, even through ruby glass.

- 4. The focus may not be sharp.
 5. Non-adjustment of the swing back, causing distortion.
 - 6. Leaving part of the picture off the plate.

- 7. Not removing the cap or slide.8. Undertime—"thin" negative negative detail.
- 9. Overexposure—"thin" with detail, but no contrast.

10. Too old chemicals.11. Not long enough in the hypo—plate discolors.

12. Too little washing—stained with pyro or crystallization of hypo on negative.

13. Pouring developer over the wrong side of

the plate.

14. Developer poured on unevenly—streaks. 15. Exposing the wrong side of plate. Double exposure on the same plate.

17. Joggling the camera when removing cap general blur.

18. Overdevelopment—too dense.

19. Underdevelopment—no detail.20. Milky alum bath—granular negative. 21. Omitting alum in hot weather—film often leaves plate—"frilling."

22. Too much pyro—too dense.

23. Excess of alkali—chemical "fog."

24. Too much glare on the subject—no detail in high light.

25. Sitter, if portrait, may move; if landscape,

the leaves.

- 26. Scratching pieces of film from the plate with the finger-nails, other plates, or water-faucet.
- 27. Negative may drop and break. 28. Dropping on of other chemicals and consequent staining of the negative.

29. Fog arising from old plates.

30. Defective plates—pinholes and spots, these also being caused by neglecting to dust the plate before putting into holder.

31. Faulty arrangement of subject and want of contrast in shadow and high-light; if portrait,

often too much.

- 32. Dust settling on the plate while drying. 33. Lens pointed at the sun during exposure-
- 34. Fingers soiled with hypo and other foreign chemicals.
 - 35. Too warm, or insufficient mixed developer.
 36. Trying to get too much on the plate—

general nothingness.

- 37. Mixture of inimical chemicals with developer, through not washing the graduate. 38. Developer mixed in wrong proportions. 39. Developing too soon after dining out.
- 40. And first, last, and all the time, if a portrait, not coming up to the angelic ideal every sitter has of himself, and, even in a more marked degree, herself.

The above do not apply to printing, wherein doubtless an equal number can be found.

Fixing Large Batches

HAVING, in common with other photographers, been troubled by imperfect fixation of prints, I have hit on a system of working which does away with spoils, and while saving the use of a second bath, has an advantage over that method.

The professional's trouble is usually connected with large batches of bromides, for with negatives or single prints it is possible to note or examine the action of hypo solution. Bromides give no definite visible signs of a fixing bath's condition, and when large quantities are fixed together there is the possibility of complex chemical action which is difficult to detect or examine. To work with confidence, it becomes necessary either to use hypo extravagantly or else use a method which has been proved by experiment.

The practice of using a second fixing bath is

probably the most reliable yet put forward, but it has met with two objections, one of which has some foundation.

The first is, that with hypo going on for 1000 per cent. dearer than it was, a second bath is extravagance, and on the face of it it seems obvious, but in practice a second bath can be used without any extra expenditure if things are managed carefully.

The second objection is not so easily met; it is this, that prints not thoroughly fixed in the first bath, if transferred to a second one before encountering daylight, will turn out perfect black and white, but if wanted for toning will

result in a mixture of sepia and blue.

The cause of this is, that by reason of not being immediately attacked by the fixing bath, the developer in the prints has had time to changemost probably oxidize-producing some compound which is impervious to the fresh hypo, and will not tone. It seems necessary that prints for toning be attacked all over by the fixing agent immediately after development, and so a second bath becomes superfluous.

After making the fixation of large batches of prints the subject of experiments lasting some months, I came to the conclusion that the most important factors to be considered are, the quality of the hypo used, the temperature of the bath, and the condition of the print when

immersed.

The most reliable formula I found was the following:

Hypo 1 lb. Potas. metabisulphite . 1 oz. 80 oz. Water

At a temperature of 65° or a little higher, this solution was capable of thoroughly fixing ninety strips of postcards (six on) in three lots of thirty each, using the whole 80 oz. in the usual strip

dish (25 x 7 x 3 approx.).

The action is subject in the first place to the quality of the hypo, some samples on the market recently being only capable of about two-thirds the work. This variation can only be safeguarded against by careful watching of the first bath made from a new purchase. The temperature is, of course, important, a very cold bath being slower and more uncertain, and to assure complete fixing of the whole ninety strips every time, it is necessary that they be developed up without forcing.

Whether it is that a forced print needs more hypo to fix it, or that by carrying a greater load of developer into the fixer it exhausts the latter quickly, I cannot say, but it seems that a batch of forced prints needs more fixing than an equal

number of smartly developed ones.

The method of handling the prints is to give quick rinse in clean water, and to immerse quickly in the fixing bath, turning them over once or twice and leaving, face up in the case of prints that sink, and face down with any that

Another method tried with success was to keep a large quantity of solution at hand, and starting off with 80 oz., to add a pint of fresh after every thirty strips, or equivalent, had been fixed, bailing out a little (before adding new) when necessary. It is possible to work this way all day with fairly good hypo at the right temperature, the prints receiving a fair turn over and at least seven

minutes' stay in the solution.

I have described this method as comprising the use of metabisulphite, but, of course, a similar way of working can be practised with any known formula, the important point being in the way the bath is used rather than the particular proportions of its formula, though, of course, it is necessary for the worker to know its composition.—Thermit, in *British Journal of Photography*.

A Time-saving Hint in Pinning Enlarging Paper to Easel

PEOPLE who work in the enlarging room generally fasten the bromide paper on the easel with push pins, but much cheaper and quite as effective for this purpose are milliners' pins. These are pins about 1 inch long with black glass heads, and sold in small bundles of about 25 to 30 for five cents. They are exceedingly sharp and handy to use, but, like push pins, are very easily mis-laid and lost in the dark-room. To get over this difficulty a small white basin, about 3 inches in diameter, with a rim similar to a pudding basin, should be bought at any earthenware shop. A hole the right diameter should be cut in the board to receive it, or on the board on which the easel slides on, or anywhere close to hand. The hole should be sufficiently wide and deep to allow the rim of the basin just to sink level on the face side of the board in which it is placed. The pins should be kept in this; they are always very easy to find, and cannot get misplaced, as they find their way to the bottom of the basin and can be picked out and replaced quite easily and are a pleasure to use. If this plan is adopted a great deal of trouble and annoyance is saved for the worker.—E. HINGE, in British Journal of Photography.

The Wider Limits of Developers

Perhaps never until the outbreak of war with Germany did photographers realize what a versatile thing a developer is. We have become so accustomed to consider that certain developing agents are desirable for certain classes of work that when faced with the difficulty of obtaining future supplies of German-made reducing agents a certain amount of mild consternation was caused.

I think that this little trouble is having a wholesome educational influence, for many professional photographers are discovering that by studying the characteristics of a developing agent they can get, it is possible to produce with it the results they thought hitherto could be only produced with an exent they now cannot get.

produced with an agent they now cannot get.

Hydroquinone and caustic soda has been for many years used for dry-plate process work, just as glycin has stood preëminent for stand development and metol-hydroquinone for gaslight papers; but in no case is the reducing agent incapable of substitution, and in practically all cases the substitute can be made to give a result just as good.

It may be of interest to discuss briefly in this

article a simple and systematic method of testing the capabilities of any reducing agent, and by so doing it will in general be found that without having recourse to different agents we can get with one only a sufficient variation in its action to meet all our requirements. The photomechanical worker has usually a good deal of different work to do as regards development, from the counteracting of the tendency in many orthochromatic plates to give harsh results to the production of harsh contrasts in half-tone and line negatives.

There could hardly be a more illuminating agent to take for an example than paramidophenol, as this base is the foundation or startingpoint of an immense number of developing agents. Benzol, C_6H_6 , is converted into phenol, C_6H_6OH , and this successively becomes paranitrophenol, C_6H_4OH . NO₂, and para-amidophenol, C_6H_4OH . NH₂. Modern chemistry has evolved derivatives of this base, many of which are patented, for each of which some individual and remarkable qualities are claimed, but the fact remains that if we carefully analyze the capabilities of the paramidophenol itself, it is found, alone, to equal practically any other reducing agent for photographic work.

In any case the routine of testing its powers is the same, *i. e.*, by using the reducing agent in solutions of various concentrations and with different proportions of accelerator and restrainer and making test negatives in each case for comparison, we shall be able to determine what degrees of contrast and differences of gradation

it is possible to obtain.

The test formulæ may be conveniently taken as follows:

A

Reducing agent		2 parts
Potassium metabisulphite		1 part
Water		100 parts

В

Anhydr	ous	sod	ium	carl	bona	ıte	4	parts
Water							100	parts

C.

Ten per cent. solution of potassium bromide.

It is always desirable to test a developer in the first instance *without* bromide, and in most cases equal parts of A and B will give a good allround developer—perhaps a little concentrated but this is a fault easily counteracted by dilution with water.

One of the most convenient, as well as the most suitable, pieces of apparatus for testing work is the Chapman Jones plate-tester, which gives for qualitative purposes almost as much information as the Hurter and Driffield slip. A modified form of the Chapman Jones tester—without the color patches—is obtainable at a very much lower price, and this will be found an admirable form of densitometer for investigating both plates and developers.

The suggested procedure is to make equal exposures to a standard source of illumination at,

of course, a fixed distance with the plate-tester, and to develop one plate with equal parts of A and B, without bromide, another with the same solution with bromide, and others with larger relative amounts of accelerator, keeping up development in each case until, say, the twentieth or twenty-fifth square just shows up. By testing a sufficient number of variations of the developer, and comparing the negatives obtained, and by modifying the formula as the tests dictate, it will be found that a satisfactory developing solution for either direct copying or process work can be arrived at with practically any of the better-known reducing agents.

Where a plate-tester of some approved pattern is not available, a satisfactory analysis of the powers of a reducing agent can usually be made by exposing plates under a well-selected negative, but some form of densitometer is far

preferable.

The moral is that where we cannot obtain further supplies for the time being of any one particular developer, there are others to be found "just as good."—T. THORNE BAKER, in The Process Year Book.

One or Two Little Things Worth Remembering

ALTHOUGH the advantages of the metric or decimal system of weights and measures (grains and cubic centimeters) are many, yet the advantages are not all on one side, and it is convenient to be able to convert a formula in metric measure into grains and ounces quickly. Moreover, many of us have been too long accustomed not only to using but also thinking in grains and ounces that we naturally prefer the more familiar units. At the same time we often see a formula in grains and cubic centimeters that we feel tempted to try at the moment, when perhaps the absence of such weight and measures in the workroom leads to deferring the matter for the moment and then it passes into the limbo of the forgotten.

Again most metric formulæ are built upon a 1000 c.c. basis, and this quantity—say 35 oz.— is rather more than we think worth while for two or three trial plates or prints. Our needs could be met by 5 or 6 ounces in most cases.

Well, then, here is a simple little tip worth remembering. Let us replace the 1000 c.c. (of solvent) by 7 ounces and then multiply the number of grains (of solids) by 3, and we get equivalent proportions within an error negligible for all ordinary purposes.

For example take such a formula as:

Another thing worth remembering is that 1 gram per 1000 c.c. is practically 44 gr. per oz. So if we want to see the quantity of sulphite and amidol per oz., we multiply 60 and 5 by 0.44, getting 26.4 x 2.2 respectively. We then see at a glance that compared with the average 25 gr. x $2\frac{1}{2}$ gr., the above formula is a little strong in sulphite and weak in amidol.

There is a third way of looking at things which is often useful at times. We may reckon

1 gram per 1000 c.c. as roughly equivalent to 1 grain per $2\frac{1}{4}$ oz. So we could rewrite this formula thus:

Finally, be it understood that these "quick change" methods are not absolutely correct, but they are quite "near enough" for all ordinary photographic daily uses.

Correct Exposures for Enlargements

Do you make enlargements from your portrait negatives? If so, the following method of determining the correct exposure for any size enlargement will appeal to you. It is practical, not merely theoretical, but may only be applied to the making of enlargements by artificial light.

When you are printing the regular order of contact prints from the negative, note the time necessary for making an Artura Iris print with the negative at a given distance from the light. This last is most important, as each succeeding test must be made with the negative at the same distance from the light. For example, we will say this Iris time is six seconds. Now make an Artura Carbon Black or Bromide enlargement 8×10 , being sure to make tests to get the exposure absolutely correct. We will say you are using Bromide and the correct exposure is fifteen seconds. Divide the fifteen by the six and you have $2\frac{1}{2}$, which is the factor to use in determining the correct exposure for an 8×10 enlargement from any negative.

Suppose, for example, the correct exposure for the Iris print is ten seconds; the exposure for the 8 x 10 Bromide will be $2\frac{1}{2}$ times ten, or twenty-

five seconds.

You may now take any negative of the same size as the one used in the first test and when you know the correct exposure for an Iris print and multiply it by $2\frac{1}{2}$ you will have the correct time for an 8 x 10 Bromide enlargement. It is easy to see what an advantage this method is to the photographer who is making a specialty of a certain sized enlargement, but it may also be used to determine the exposure for any other sized enlargement. It is not necessary to find the factor for each size, as the result may be obtained without making the different size test enlargements.

If a larger print is desired you have the exposure for the ten-inch print; square the ten and you have 100. You want to make a 14 x 17 print; square the seventeen and you have 289; divide the 289 by 100 which gives 2.89, showing that the seventeen-inch print has an area 2.89 times greater than the ten-inch print. Hence if the proper time for the 8 x 10 enlargement is twenty-five seconds, the time for the 14 x 17 enlargement will be 2.89 times as long, which is seventy-two and one-quarter seconds. The light decreases in intensity in proportion to the larger area which it covers, so the time for any size enlargements may be determined by having the correct exposure for a given size. In using this factor to determine the exposure it is understood that the lens of enlarging camera is stopped

down to a given point and used at the same stop

for all exposures.

The process of making enlargements of a given size may be made still more simple by having a set point for the enlarging easel and camera front where the full size of negative is to be enlarged, making the apparatus fixed focus. Of course, where only a part of a negative is to be used, the regular method of focussing would have to be resorted to.—Recorder.

Non-actinic Light for Photographic Use

A NEW method employed by J. Bardin in France, says Scientific American, makes use of the principle of platinum sponge, which is first heated in a flame, and then preserves its heating power when exposed to vapor of alcohol, ether or gasoline. The inventor makes use of this property by employing a small round tablet made up of a platinum salt, a lithium or strontium salt, asbestos, magnesia and alumina. A small bottle or lamp holding alcohol, etc., is provided with a wick with flat top upon which is placed the tablet, and after lighting and then blowing out, the tablet glows with a red or other non-actinic light which can be used in the dark-room.

PATENT NEWS

Under this heading it is proposed to include each month a list of all the U.S. Patents: and brief abstracts of the more important, and to include also such foreign patents as present special features.

Copies of any patent can be obtained from the Commissioner of Patents, Washington, D. C.

Price, five cents each.

Postcard Printing Apparatus. R. Scholze. 1255054.

Magazine Back for Cameras. W. F. Folmer. 1255868.

Means for Developing Films. R. Newman. 1256247

Print-developing Machine. Harry L. Blondes. 1256290.

Making Photographic Material. H. J. Garsman. 1256784.

Device for Manufacturing Screen Photographs for the Half-tone Engraving Process. E. Eberhard. 1256886.

Photographic Shutter. Paul J. Marks. 1257624. Focussing-finder for Photographic Cameras. C. F. Speidel, Robt. Kroedel, Wm. A. Riddell. 1257648.

Camera. Wm. A. Warman. 1257656.

Lens-front for Cameras. Jos. Goddard and

Wm. S. Hutchins. 1257842. Camera Attachment. J. M. Jordan, Jr. 1257874. Color-negative Film. Percy D. Brewster. 855943.

Photographic Film Feeder Device. Wm. Bausch. 1258387.

Camera Carrying Case. O. A. Nord. 1258437. M. Neill. 1258436. Camera.

Focussing Device. R. A. Read. 1258459.

Film Holding Device. Glen M. Dye. 1258756. Film Marking Camera. S. W. Spangler. 1259152.

Coloring Photographic Images. Wm. V. D.

1259411. Kelley.

A method of producing a double-colored photographic strip film, which consists in recording the two families of color in cycles of four color values, printing all of one family of color value records upon one side of double-sensitized film in recurring sets, printing all of the other family of color value records upon the other side of said film in recurring sets registered with said first prints, developing said images, treating one side of said film to render all the images thereon capable of absorbing dye and transmitting light, immersing the film in a dye bath to impart to the images on the treated side a color complementary to the family color recorded thereby, washing and drying, applying a protective coating to the dyed side, treating the other side to render all the images thereon capable of absorbing dye and transmitting light, immersing the film in a dye bath to impart to the latter images a color complementary to the family color recorded thereby, and washing and drying to complete the film.

Camera. Rodney E. Reed. 1260049. Making Multiple Photographic Exposures.

John G. Capstaff. 1260324.

A method of making composite photographs by light recording a photographic image upon one of two superimposed bodies of like sensitiveness, both of which are accessible for individual exposure without light affecting deleteriously the other body, which comprises passing light of the proper intensity and of such wave lengths, with reference to the light absorption properties of such first-mentioned body, from the image that the light will affect photographically the first of the superimposed bodies and be absorbed in it, no material amount passing through to the second one and light recording an image upon the latter.

Film Camera. Wm. F. Folmer. 1260356. Photographic Film Strip. Wm. F. Folmer.

1260357.

Photographic Film Pack. A. G. Ruttan. 1260458.

Photographic Method and Apparatus. C. W. Kanolt. 1260682.

Film-holder attachment for Camera. A. L. Harrell. 1260898.

Printing Machine. H. V. Photographic 1261177. Strong.

View-finder for Cameras. Chas. H. Stout. 1261643.

Method of Making Moving Picture Films. Paul H. Terry. 1261648.

The Motographic Motographic Journal of America



Published Monthly With Illustrations

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THOMAS COKE WATKINS, Editor

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CONCERNING BALANCE IN A PICTURE

By "PROFESSIONAL"

F all the various principles in the composition of pictorial art, even those which receive the most careful consideration of advanced painters, there is none that equals in importance the fundamental one of balance.

To the student in the school of art, as well as to that class of photographers which desires to incorporate artistic principles in its work, balance is a source of ever-present anxiety. We may understand fairly well the principles of "concentration of interest," and possibly be able to employ subordination and the force and power of "contrasts" as effective aids toward the accomplishment of the result. We may have a good general idea of lines, their rhythmic movement, as well as their character, force, and the various uses to which they may be put. We may possess a clear understanding of tone value, atmosphere, and unity of parts, but a thorough knowledge of and ability at all times to apply to our compositions proper balance

is a matter that is extremely difficult to accomplish. It is even perplexing for the writer to adequately impart that little information which he has been able to acquire only by much hard study. He sincerely hopes that the editors of the JOURNAL and other photographic magazines, which are doing so much of late toward the artistic education of photographers, will take steps toward securing more contributions on this subject from recognized teachers of art. These men, writing for the especial benefit of photographers, would give us that information of which we, as a profession, are so much in need. As a first step toward what is to follow on this subject it is advised that the prints from the negatives be made full size of plates, no trimming being done, except to remove the white edges of the paper, caused by the rabbet of the printing frame. Provide yourself with two L-shaped pieces of cardboard about 2 or 3 inches wide, and each several

(293)

inches longer than the full size of the print to be trimmed. Let these cardboard strips, resembling the carpenter's square (which would serve as an excellent guide in making them), be employed for spacing the print by reversing and covering its margins. By laying them on the picture, and moving them first one way and then another, you may judge how it would look if trimmed. The outside edges of the picture being thus covered you are better enabled, than you would be in any way, to measure the results.

Perhaps a good way to illustrate the importance of balance, as well as to ascertain whether or not it has been obtained, is to take one of your own untrimmed pictures, apply the "shapes" mentioned above, as you may decide, and then tack the whole on a board. With a rule, find the exact center of each of the four sides of the print, insert a tack, and connect the opposite tack by a coarse black thread. You have now determined the exact center, vertically and horizontally, and divided the picture into four equal sections by a fine line which is easily seen and does not occupy much space. Set the board against the wall so that the bottom of the picture is perfectly horizontal to the floor. Then you and one or two of your most capable assistants seat yourselves a few feet from the picture, and by critically analyzing it endeavor to find some way by which it may be improved.

When viewing this picture bear in mind that its actual center at the point where the threads cross at once assumes a pivotal position, guiding you in forming your opinion. If the picture is vertically balanced on two sides the results are very pleasing; but to be perfectly balanced it should be balanced above and below the horizontal line as well. Viewing the picture with proper consideration for certain art principles, it may be found that the right angle pieces of cardboard and threads as arranged are not at all correct and need to be readjusted, and possibly again adjusted to show the picture to the best advantage. Therefore, it is of importance to begin operations with an untrimmed print.

We will suppose that some of our

readers may adopt the plan suggested, changing the pictures from time to time, or having several similarly arranged, to which reference can be made. Certain points that are mentioned here will be found more applicable to some cases than to others. The writer frequently employs this method, much appreciating the companionship of others, for a general discussion is always helpful, besides creating an interest in his work and at the same time assisting in the education of his employees.

Spacing

Although the spacing of prints is a great aid toward attaining balance, it may, however, only be likened to the methods of the painter in the placing of his intended composition upon the canvas. Neither in the painter's case, nor in our own, does it tend to produce more than a small proportion of balance. It does not correct or overcome errors in his work, nor will it conceal our own shortcomings, although marginal blunders are often eliminated by trimming the print. The balancing of the composition is supposed to have been done in the arrangement of the design in the first place and carried out through its various stages. The spacing of the print is for the purpose of obtaining the pivotal center of the picture, which for convenience was made on a larger plate than was desired for the finished proof.

The question now arises, from what stand-point are we to judge whether or not the picture, if made, is properly balanced, or how to bring this about in arranging the design?

Reproductions of Good Paintings

As an assistance in readily explaining some of these points, I would suggest that the reader procure a few good reproductions of pictures that may be recommended to him by an artist capable of discriminating between good and poor reproductions. Space them by the threads as above described, and have them near at hand with your own picture similarly treated. I would suggest that these reproductions be of subjects some-

what low in tone rather than abounding on the strong lights, for no other reason than because such things are likely to be more faithful reproductions of the originals. If the values of the paintings are inaccurately reproduced in the copies the latter are apt to be very misleading to photographers drawing conclusions from their study. If good reproductions of these low-toned or even high-keyed pictures are difficult to obtain do the best you can. But if certain parts of the picture appear in a key of color as bright or brighter than that part which the artist evidently intended to be the central point of interest, the accuracy of the reproduction may be questioned. correct color values of the original may easily have been lost in reproduction. Don't study bright, sharp pictures in too strong a light.

It is well to mention that many fine carbon reproductions are sold which show only a part of the original pictures, such, for instance, as the head and onehalf or three-quarters of a portrait, which in the original was full length. Sometimes the picture contained two or three figures. In such cases many things in the original which the artist had in mind when he painted it are not shown, and the reproduction is valuable to those artists only who can derive instruction from the fragments seen or who are familiar with the parts omitted. Purchasers of such pictures are entirely dependent upon the artistic knowledge and conscience of the publishers, and must accept their dictum of what could or could not be left out of the reproduction without injury to the picture as a whole.

Definition of a Common Art Term

Those who have followed this series of articles will have noted that on many occasions the writer has used the expressions "power of attractiveness," "degree of attraction," "proper measure of attraction," "weight of attraction," etc.

Pictures are judged with a view to properly determine their qualities in balance, values, etc., by the degree or extent to which their component parts, in their relation to each other, attract the eye. The white parts of a picture attract the eye most, unless they are over-balanced by a larger mass of black. The size and intensity of the white, and the size and intensity of the black, with the gradations in tone from one to the other form the gamut over which the eye unconsciously runs in the survey of a picture. Now, although the eye is sensitive to these various degrees of light and dark, it by no means follows that all persons have an equally acute sense of discerning the finer or more subtle shades of difference without previous training or cultivation. When we take our pupil under the skylight to watch the arrangement of screens and curtains he is at first unable to discover much if any difference in the light on the face or figure of the model until his attention is drawn to it by various illustrations. Later he develops this faculty. experienced and careful operator sees this very quickly, and, because of his training, is very sensitive in noting delicate shades of light and dark in all parts of pictures. Therefore, when we speak to him of the "degree," "power," 'measure," or "weight" of attraction he readily understands that we have mentally weighed these things and are able to gauge their proper values. If they are unduly prominent they should be "lower in key," or, if they are possessed of too little attraction, they should be "raised." "keyed up," etc.

Powers of Attraction of Tones and Masses by Their Location

All parts of a picture have certain powers of attraction, even a small mass in a medium low tone, and the proper relation these parts bear to each other in size, location, and attractiveness, has very much to do with balance. Such portions, beside attracting attention to themselves, also possess the power of drawing attention from other things. Thus it is that it is necessary when one part of a picture has been made brighter, or more attractive, to devote attention to other parts that may have suffered by the change.

We mentioned above that the location of spots, masses, and even units of vary-

ing degree of attractiveness exercised much influence upon the correct balancing of a picture. Mr. Poore in his excellent work on *Pictorial Composition* describes this point very clearly by comparison with the steelyard.

The Steelyard

"On the principle of the steelyard the farther from the center and more isolated the object is the greater its weight or attraction. Therefore, in the balance of a picture it will be found that a very important object placed but a short distance from the center may be balanced by a very small object on the other side of the center, and further removed from it. The weight of the pictorial interest may be on one side of the picture, and the other side be practically useless so far as picturesqueness or story-telling opportunity is concerned, but find its reason for existing in the *balance*, and that alone.

"In the emptiness of the opposing half, such a picture when completely in balance will have some bit of detail or accent which the eye in its circular symmetrical inspection will catch unconsciously and weave into its calculation of balance; or, if not an object or accent or line of attraction, then some technical quality, or spiritual quality, such, for example, as a strong feeling of gloom, or depth of penetration, light or dark—a place, in fact, for the eye to dwell upon, as an important part in connection with the subject proper, and recognized as such.

"Let the student when in doubt weigh out his picture in the balances, and then verify it on the steelyard."

Before commenting upon the study of the pictures that have been spaced by the L-shaped cardboards mentioned above, and divided into equal spaces by the threads, we may mention some points that are easy of accomplishment, and after once being brought to the serious consideration of a photographer, should be adopted and put into practice.

Vertical and Horizontal Balance

As an aid in obtaining balance in pictures in these two directions, the

photographer would be greatly assisted in the arrangement of one or two persons by the study of sculpture, in which the center of gravity plays an important part. Access to art galleries or museums where there are many casts of the world's famous statues is available, to some extent at least, all over the country. We believe that the careful study of sculpture is, in many ways, as important as that of painting. By its study many of the most common errors of vertical and horizontal balance in individual portraiture would be corrected.

Blunders of this kind are too frequent. We all know of the law of gravity, and that a figure, to impress the mind with its stability, should never give rise to a mental inquiry as to whether this law has been observed. Yet we are constantly coming across pictures that are not vertically balanced. They appear about to fall over, one way or another, and simply because the center of weight of the mass, if carried by a straight line to the floor, would often fall far outside its proper base line. Vertical balance is necessary if the mass is to have the appearance of being properly supported.

In extreme cases, if the vertical balance of a figure is incorrect, it may be due to the camera not being level, or trimming the print badly, or that it slanted, or by cutting off something against which it was leaning, leaving the impression of its not being properly supported. The writer has within a few months served on three juries at exhibitions of pictures. It was painful to note how some pictures, most excellent in other respects, gave him the impression of imperfect balance in these directions. It seemed to him that these defects must be self-evident to all who were capable of producing otherwise good and even meritorious work. It is simply due to a careless observance of a law of physics that must be well understood by even most school boys.

If a figure is thus posed see to it that the support is seen sufficiently to give the eye no sense of deficiency in that respect, which is an essential point in sculpture.

Mr. Leonidas Taft, the noted sculptor, made special comment on this point in

his remarks on the evils of over-retouching, and also that "we should not be afraid to show the formation of the bony structure of the skull," even if it be pleasantly covered with flesh. He mentioned also a point in balance, the substance of which we will here quote, for his exact words have escaped our memory:

There should always be a sufficient part of the body showing to support the head. The vignette is generally condemned. Approval has many times been given to those pictures which, besides showing the figure sufficiently to balance the head, have been so vignetted by long or deep-cut teeth that the body gradually melts away until the bottom of the print is reached. Of course, it may be taken for granted that it is not so necessary for the body to show distinctly and sharply as in the old-time photograph as it is to conform to the view of artists who seem to delight at times in mere indications of the body, but the suggested size must be sufficient to give support to the head.

This, of course, is here mentioned with due regard to the balance of light and dark, etc., which, after some remarks on Horizontal Balance, will be taken up

later.

THE EFFECT OF THE IRON CONTENT OF AMMONIUM PERSULPHATE ON ITS PHOTOGRAPHIC REDUCING POWER 1

By S. E. SHEPPARD, D.Sc.

T is well known that different commercial preparations of ammonium persulphate show wide variations in their behavior in attacking the density of photographic negatives. The typical peculiarity of persulphate, namely, its selective action on the higher densities, has received many explanations. In this direction the most important contributions to the chemical mechanism of persulphate reduction are the following:

H. Marshall (Tr. Edinburgh Phot. Soc., 1900, xxiii, 168) showed that the action of persulphate on metallic silver is what is termed autocatalytic, i. e., it is accelerated by the reaction product, the dissolved silver sulphate. A chemical explanation of this is the formation of an intermediate silver persulphate, which is a stronger oxidizer than the ammonium or potassium persulphate; the action in question may be considered to take place in stages represented by the following chemical equations:

¹ Communication No. 60 from the Research Laboratory of the Eastman Kodak Company.

 $(1) 2Ag + (NH_4)_2S_2O_8 = Ag_2SO_4 + (NH_4)_2SO_4$. Very slow.

This reaction, the formation of silver ions by the direct attack of persulphate on metallic silver, is very slow.

(2) $Ag_2SO_4 + (NH_4)_2S_2O_8 = Ag_2S_2O_8 + (NH_4)SO_4$. Very rapid.

This reaction, a purely ionic interchange, is very rapid.

(3) $2Ag + Ag_2S_2O_8 = 2Ag_2SO_4$. Rapid. Finally, the attack of silver persulphate upon metallic silver, is also a rapid reaction.

In the absence of silver ions (or other catalyst) the reaction is slow at first, then becomes rapidly accelerated.

By adding silver ions, e. g., silver nitrate or, better, silver sulphate, to a sluggish persulphate solution the initial retardation is overcome.

It was suggested that this autocatalytic action of the dissolved silver afforded an explanation of the superproportional action. This, however, is Unless other factors not the case. intervene the rate of reaction would still

be proportional to the density, so that the undoubted acceleration by dissolved silver is not a complete explanation.

Different observers had noted that the water used in making up a persulphate solution affected the action. This was taken up by E. Stenger and H. Heller (Ztsch. Wissent. Phot., 1910, ix, 73). They found that, depending upon the amount of chlorides in tap-water, the type of reduction changes from the superproportional to the subtractive. They attribute this chloride poisoning to the formation of relatively insoluble silver chloride, which lowers the concentration of the catalytic silver ions and protects the silver grain from further attack.

It can, however, be shown that even with distilled water free from chlorides the anomaly persists. Schüller (*Phot. Rundsch.*, 1912, p. 236) brought forward more definitely a suggestion often tentatively advanced, namely, differential diffusion. Schüller adopts the silver persulphate or catalytic theory, but considers that superproportional action on the higher densities is much less determined by poisoning in the lower densities than by a restriction on diffusion in the higher densities.

As against these explanations, Luppo-Cramer (Colloid Chem. und Photographie) advanced a colloid chemical theory. He considers that the composition of the developed and fixed negative image is not pure metallic silver, but remains an absorption compound of silver and photohalide. The amount of photohalide and, a fortiori, of normal silver halide, is very small, but it is supposed to be greater in proportion as the exposure is less. There is then more photohalide in the lower densities than the higher. This he suggests is due to a more energetic attack of the developer on the grains of the higher, more exposed densities.

Luppo-Cramer regards this as an explanation of the peculiarities of photographic reducers. Reducers with a silver halide solvent present in solution with the oxidizing agents—as in Farmer's reducer—will attack the lower densities more strongly than the upper, and we get subtractive action. On the other

hand, in reducers like persulphate, or in chromic acid poisoned with soluble chloride, the lower densities having more halide are better protected from attack.

It is to be noted that the facts and explanations brought forward still fail to account for certain minor characteristics of persulphate reducers. One of these is the already mentioned variation, particularly of initial activity, between different preparations having the same persulphate content. Another is the action of acid and alkali on this initial activity.

Luppo-Cramer, in support of his photohalide theory, instanced the equalizing action of sulphocyanide (a silver halide solvent) upon ammonium persulphate. This combination was first recommended by Bayley and Puddy (*Phot. News*, 1900, p. 174) as giving a

proportionate action.

In the course of some experiments intended to test Luppo-Cramer's views on the negative image, Bayley and Puddy's combination was tried. It cannot be said that it is very satisfactory either chemically or photographically. In the first place, like other complex cyanides, sulphocyanide is attacked by persulphate with the liberation of hydrocyanic acid. In the second, measurements with sensitometer strips show that there is no certainty of proportionate action.

In trying the combination with different persulphate preparations it was observed that they all reacted, more or less vigorously for *iron*. Further, it was noted that the preparation showing the least initial activity or the greatest initial sluggishness gave the weakest reaction for iron, while the most vigorous preparation, one in fact very difficult to control, gave the strongest reaction.

The preparations were therefore analyzed for iron, with the results given later.

On adding ferric sulphate to the solution weakest in iron until it was approximately equal in this respect to the strongest, the initial activities were made practically equal. Quantities of iron in excess of this relatively small amount gave reducers of uncontrollable character, the action becoming very irregular and localized.

The small variable amount of iron salt present as an impurity in ammonium persulphate is thus the cause of its variability, and iron, however introduced is a powerful catalyzer of the action of persulphate on metallic silver. The chemical reactions involved show that we have here a case where a sidereaction supplies more rapidly the autocatalyst for the main reaction, while the main reagent reënergizes the side reagent or catalyst. Iron, as a ferric salt, e. g., ferric sulphate, rapidly attacks metallic silver, forming silver sulphate and ferrous sulphate:

 $(4) \text{ Fe}_2(SO_4)_3 + 2Ag = Ag_2SO_4 + GSO_4$

2FeSO₄.

and the ferrous sulphate is rapidly re-oxidized to ferric by persulphate.

 $(5) 2 \text{FeSO}_4 + (\text{NH}_4)_2 \text{S}_2 \text{O}_8 + \text{Fe}_2$

 $(SO_4)_3 + (NH_4)_2SO_4$.

so that the concentration of ferric iron tends to be kept up to the initial level. Further, the silver salt (or silver ions) supplied by reaction (4) give the necessary acceleration to the persulphate reaction proper, these reactions being those already noted in equations (1),

(2), (3).

The function of the iron then is somewhat like that of a pilot flame. By immediately furnishing silver ions, through reaction (4), it abbreviates the initial retardation and gets the rapid following reactions in full swing without delay. At the same time, the catalytic action of iron explains in part the effect of acidity and alkalinity on the persulphate reducer. So long as an acid reaction obtains, the iron will be in the active ionized condition. If the reaction become alkaline the iron will be progressively removed by hydrolysis, being converted to ferric hydroxide, which,

moreover, is strongly absorbed by gelatin, with a tanning effect and probable reduction in diffusion velocity.

It is necessary to note at this point that this iron catalysis does not stand in any contradiction to the other aspects of persulphate reduction. In particular, experiments with iron catalyzed persulphate strongly support the theory that it is a superposition of diffusion conditions upon autocatalysis which leads to the characteristic persulphate effect. This superposition of diffusion or coupling of diffusion with a chemical reaction in the photographic layer has been frequently noticed, and we can generalize the present result as follows:

1. If in a photographic process the reaction products affect (accelerate or retard) the primary action, then the speed of this will depend upon their rate of removal and momentary concen-

tration.

2. These products, if soluble, will tend to diffuse away most rapidly in the direction of regions of lower concentration.

3. From the known structure and distribution of the negative image, diffusion, and hence exhaustion, of reaction products will occur more easily in the lower densities than in the higher. Conversely, there will tend to be a superproportional accumulation of the reaction in the more strongly exposed regions, the lower layers next to the support eventually acting as reservoirs.

Amounts of Iron

The percentage quantity of iron involved is not of a very large order, as will be seen by the following data:

Sample.			Make.	per cent.	persulphate.	Remarks.
No. 1			Commercial	98.3	0.0006	Could just be used in 5 per cent. solution; quite active at once.
No. 2	,	٠	Commercial (same firm, different stock)	97.8	0.00162	Could not be used in stronger than 2 per cent. solution; very active at once.
No. 3	•		Laboratory pro- duct	98.2	0.000088	Very inactive; in 5 per cent. solution hardly any action in fifteen minutes; iron, alum or silver nitrate brought it up to No. 2.

In a later communication data on the relation of the iron concentration to the action measured sensitometrically will be given. Meanwhile it may be noted that in a 5 per cent. solution persulphate the amount of iron required to perceptibly affect the initial activity in dissolving silver is of the order of 1 part in 1,000,000.

The tolerance or upper limit of iron permissible appears to be of the order of that found in preparation (2), 1 to 2 parts per 1000 of solid persulphate.

My thanks are due to Mr. W. H. Davis for assistance in the experimental

work.

AEROPLANE PHOTOGRAPHY

By CHARLES G. GREY

PERHAPS a few hints on the actual photographing of aeroplanes may be useful to those who have not as yet tried the experiment. Some of these hints may be an impertinence to the more experienced readers of this journal; but, being myself very much of an amateur photographer, I may perhaps save some of my readers a few wasted exposures by pointing out some of the traps into which I, myself, have fallen.

In the first place, it is well to remember that some aeroplane-makers use white fabric for their wings, and others use stuff of a yellowish shade. Others, again, use a varnish—commonly known as a "dope"—which is dark brown. Now, according to the color of the planes, so you must be careful about your back-It so happens that both at Brooklands and at Hendon you are so situated in the enclosures that you are apt to get the machines against a background of dark trees or against a hillside, particularly if you are taking a machine just landing or just leaving the ground. If the machine happens to be one of the really white ones, of course the wings stand out nicely against the dark ground; but if it is ever so pale a yellow or brown, it simply disappears into the ground, and you need a considerable share of the eye of faith to see that it is there at all, particularly if the light is bad and you are forced to under-expose. Therefore, in the case of a yellow or brown machine, it is better to make sure of getting it against the sky, for then you are at least sure of a resonably good silhouette, and a really good silhouette will often make quite a nice picture.

On the other hand, if you try to get a photograph of a white machine against a bright blue or white colored sky, particularly on bright spring days, when there is a white haze hanging about, you are quite apt to find that you have produced an excellent photograph of a machine without any wings, or with only one wing, owing to the blue or white sky and the white planes all having about the same actinic effect on the plate. Naturally, this does not hold good to the same extent in the summer, when one sometimes has the luck to get a sunny day which is calm, for really bright sunlight allows one to stop down to such an extent that all the details of the wings come out clearly, and the sun itself makes clear shadows from the little irregularities of the wing-surfaces; but even then one has to be very careful.

Another thing that takes careful watching is the attitude of the machine at the moment of taking the photograph. As I mention later in this article, one gets the best effects by swinging the camera round to follow the movement of the machine, so that the machine stands out sharply against a slightly ill-defined foreground. Now, a machine coming sraight toward one may give simply an end-view of the body, and the wings may come out as straight lines on either side of a little triangle, with some sticks hanging below it—these last being the struts and skids of the landing-carriage. On the other hand, if one waits till one gets the machine side-wise-on, one has a good view of the body and landing-wheels, but the wings disappear into the body, particularly if

one gets them end-on.

Then, again, if one takes the machine directly overhead, as so many people are fond of doing, one has an absolute plan of the machine from underneath—or a "worm's-eye view," as a friend of mine calls it. This looks like nothing on earth, unless one holds the photograph directly over one's head, gets a crick in one's neck looking at it, and uses one's imagination a good deal.

The difficulty is to get a view partly underneath and slightly to one side, which will give a general all-round impression of a flying machine. Myself, I generally try to get at least two views of each machine—one coming toward me, but showing plenty of the side, and another one just as it has passed, so as to show the arrangement of the

tail.

It is difficult to judge distances in photographing aeroplanes owing to the vastness of space in which they fly. The trouble is accentuated by the fact that aeroplanes are very much bigger than one thinks, and they, the monoplanes particularly, are so symmetrically designed that they always appear to be much closer than they really are. consequence, one is apt to go snapping away cheerfully at machines which are a hundred yards or more away, under the impression that they are near enough to make quite a good picture, and then feel annoyed because they come out a mere speck. A friend, who is, I believe, an authority on photography, showed me not long ago some photographs he had taken in France, thinking the machines were quite close, whereas, when developed, they looked like a flaw in the plate.

I use a 5 by 4 Goerz camera, with a Celor lens and a focal-plane shutter, which is as good a machine as one needs for most fast work. If going where I may take a lot of photographs, I take a film-pack, and expose accordingly, using the films in the middle of the day, when the light is at its best, and the plates later. In this way I have obtained

excellent results, with films, of aeroplanes travelling at over sixty miles an hour.

In using a very fast shutter and plates on aeroplane work, when a machine is actually flying, there is one objection which applies equally well to photographing racing motor-cars or trains, namely, that for pictorial purposes the machine might just as well be standing still, so far as an impression of rapid motion is concerned. I therefore make a practice, when the light is good, of stopping down to f/8 or f/11, and giving an exposure of about 1/200, instead of opening up the lens and giving 1/1000. I then get the cross-lines of the viewfinder, which is on the top of the camera, set on one part of the machine, and swing the camera around to follow it as it goes by. The result is that one gets the aeroplane dead sharp, and everything else slightly blurred, which is exactly what one really sees when following a flying machine with one's eye.

Of course, when the light is bad, one has to do this even with the lens open

to f/4.5.

It is possible to get excellent photographs in the same way with an ordinary camera, with the ordinary shutter on the lens, and using films; but the exposure must not be less than 1/50, for it is almost impossible to avoid an unintentional vertical shake in the camera, as well as the intentional horizontal swing; and with the viewfinder on the front instead of on top, it is harder to keep the aeroplane in exactly the same spot on the finder. Of course, in any case, with so slow an exposure, the back-ground is hopelessly blurred, but that always seems to me to give an increased impression of the speed at which the aeroplane is travelling.

It is worth while remembering that an aeroplane taken against a skyline will always do with a little less exposure than if resting on the ground and lighted

only from above.

For those who do not run to focalplane shutters and lenses which open out to f/4 or so, I will give a few hints on photographing stationary aeroplanes. In these days of properly-arranged aerodromes, with railings to keep people from trespassing on the landing-ground and getting run over, one can take quite interesting pictures of machines standing still, or just on the point of starting. The railings themselves provide an excellent rest, and it is the custom of aviators to bring their machines fairly close to the rails, in order to pick up passengers. Even a comparatively slow shutter, giving an exposure of, say, 1/25 or 1/50 of a second, will manage to catch a characteristic attitude of a well-known flier or the peculiar pose of a mechanic swinging a propeller to start an engine.

The stationary photographer—if I may use the term—should be as careful as he who is taking moving machines to see that his planes do not fade away into the blue sky or dark background, as the case may be, and in a general way it will be found that a better picture of an aeroplane at rest can be had by stooping, and getting the camera as low as possible, so to get a somewhat upward view of the machine. It makes sure of getting some width in the planes.

Just a hint or two also to those who have the chance to run about on the ground itself near the machines. Do not stand in a direct line behind the machine

when the engine is about to start or you will get your camera full of dust or dirt which is movable, for the propeller makes a draught of anything from forty to ninety miles an hour, according to the power of the engine. Do not stand in a line with the propeller beside the machine, for if the propeller hits anything and bursts, the pieces fly with the velocity of a bullet. Do not get in front of a monoplane, and then walk up to it looking into your view-finder, for if the engine started up, and the machine charged at you, you might not have time to get away, and the propeller blades would simply hew you asunder. In a general way, keep your eyes very much about you, for machines have a disconcerting way of swinging around suddenly when running along the ground, and you may be knocked down and damaged by one machine when photographing another. Do not lean up against the tail-spars or body of an aeroplane if you have respectable clothes on, or you are likely to find yourself well smeared with half-burnt castor oil, which is used the engines.—Amateur lubricate Photographer.

A MESSAGE

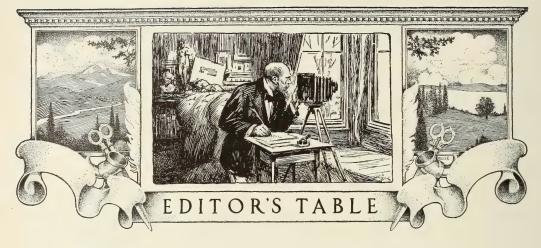
Photography is a much more wonderful medium of expression than its staunchest adherents realize today. As I travel and study what art has accomplished in the various countries and what nature really means and is, photography's possibilities assume gigantic proportions. It is to the men who understand nature and love it, and who love photography, that the future will bring about revelations little dreamed of today. These are not idle words nor idle predictions. If my faith and my enthusiasm will encourage the professional of America to still worthier efforts, good as the past may have been, I shall feel that he has helped the cause we all believe in.

ALFRED STIEGLITZ.



BY E. L. MIX NEW YORK CITY





EXPRESSION AND LIKENESS

N what does likeness depend? It seems a simple question, but it is one which cannot be answered off-hand. Likeness is associated with detail of feature; but such is scarcely a sufficient definition, for we can recognize our friends a block away when not a single feature can be defined. Perhaps likeness lies in the masses of light and shade; but these vary according to the light, or the hat worn, or a score of other variable quantities. It can scarcely be considered as lying in outline, for little of unvarying or distinctive outline is seen except in profile, and we do not see much of our friends by profile. At least it may be considered that likeness at close range depends more on the surfaces than on the outlines of the face. Doubtless. the eye is familiar with every detail of feature, every mark, and is equally conversant with every characteristic pose or gesture, and with every appearance of masses of light and shade on the face when at a distance. The eye sees a figure at a distance, and at once recognizes it, without knowing why. It may be a peculiarity of walk or poise of the head. That is all that can be seen at a distance, but for the rest, it is known to the mind of the one who sees, and that is sufficient. A figure is known to a certain extent by its motions; for many persons, especially men, have some peculiarity of gait. But to endeavor to reproduce this peculiarity would in photography lead to disaster;

caricature is best able to portray it, and that is a province that professional photography has no wish to enter, though it may occasionally unwittingly stray in that direction. "Arrested motion," as it is termed, is the rock on which such attempts come to grief. But if the suggestions of motion in a figure be beyond the scope of professional photography there is yet left to us the equally characteristic attitude of repose; every man-and every woman-has a characteristic attitude, and in that attitude there is one chief and dominating factor. It may be some beautiful pose of the hands or the placing of the arms. It may be a frown, or a craning forward of the neck, or any one of a score of things. In any full length the appreciation of a characteristic attitude goes far toward success.

The photographer very naturally, and inevitably, makes the portrayal of the face his chief business; but probably a mistake has been made in too much of exclusiveness in this direction. obtaining of a more comprehensive likeness, as opposed to mere detail of feature, is a class of work with possibilities; and is a class apart from the mere pictorial rendition of three-quarter or full lengths. This latter is very beautiful, and has both a commercial and an esthetic value; nor can it be said that we see too much of it. But there is equal room for rendering in which the merely pictorial yields in part to character. This character-likeness is indeed

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to the figure what expression is to the features, and it is to be obtained in the Without expression, the same way. features, however beautiful or however correctly photographed, are a mask rather than a soul. With it we obtain the life and charm of the true portrait. Expression can seldom be conjured up by the sitter; it must come naturally and spontaneously and without consciousness. There is an art of taking beautiful photographs, which from their beauty are pleasing to all who do not know the originals, and which are considered as likenesses because they are recognizable. There is also an art of obtaining a true likeness—and one not incompatible with beauty or pictorial quality—through a correct rendering of attitude and expression. And this latter is not cultivated as much as, with profit, it might be.

CRITICISM

If the successful photographer is asked as to the causes which have helped him he will invariably include, and often give a prominent place to, the hints and advice of his friends. He is right; the suggestion from one who has understanding to give it is a very necessary part of our education, and happy should be the man who can claim it.

Just think about this same advice. The result of it is to help the photographer to better work, and therefore the logical conclusion is that the work has faults, and that these faults have been pointed out. The work may not have been condemned, but it has not been flattered. The man has had a sitter in his studio, and he has done his level The sitter is pleased with the best. result—so is the photographer. friend—the brother photographer, probably—looks at the picture. He has not been concerned in the manufacture of it, and so is better able to see at a glance if anything is out of gear. As a photographer he may appreciate the work and thought which has been put into the print, but as a "candid" friend he puts his thumb over one spot in the print. It may be that the producer of the print at once notices the fault, or there may be some discussion on the point. More than possibly, it will be decided that after all the fault is no fault. In any case the discussion settles the point, or at least leaves it simmering in the photographer's brain to be finally decided later. And so, if it was a fault—and often enough the photographer decides that it is—it will not run through his work until the end of things.

How many photographers are there who do not welcome that kind of advice commonly called criticism? Very many; we almost fear a very large majority. How common it is to be shown a picture —or a score of pictures—by a photographer who asks your opinion when he means that he is fishing for flattery. It is a rather puzzling attitude. would have been thought that a photographer would have welcomed rather than resented criticism. And doubly so, since it can scarcely be denied that the inertia of thousands of photographers as the the quality of their work is one of the leading causes why so many of them are in an insecure position; in dread of the other man and in hatred of the amateur.

Criticism is not always an easy thing. Very often a man's work would require an essay to point out what is the matter with it. For sometimes a man will show work which plainly says that he has attained a fair proficiency in the technic of photography, and yet has not grasped the most elementary meaning of picturemaking. How can you tell him such a knock-down fact without making him angry?

There are several things necessary if a photographer would rise. He must always keep a wide-awake and alert brain around his work, and he must feed and educate his brain with the books and the opinions of others. In some respects the spoken opinion is preferable to magazines—both are necessary. In the magazine it is so easy to read the faults of others, and this is comfortable but not helpful; in an honest criticism we read our own faults or mistakes. A magazine ought rather to start a thought than to dogmatize a fact; and it is so easy to evade the

thought and pass on to the next page. In a conversation the effort to think is

forced and is followed up.

The good fellowship which has been so much fostered by the conventions has already led to more than one organized club where photographers meet and exchange opinions; and it has created quite a habit in a few cities of intervisiting among the galleries. It is a good movement, and should be helped The exchange of criticism is mutually helpful, and none can judge the points which make or mar a photograph as well as can a fellow-worker. Let us then have done with the old notion which angled for flattery and preferred a blind self-deception to the healthy pleasure of knowing one's work and knowing that it is good.

DEPTH WITH DIFFERENT LENSES

RECENT query from a reader raised once more the everlasting subject of the variation in depth that exists with lenses of different types. On this matter much misconception seems to exist. On the one side we have people declaring that depth depends solely on aperture and focal length, and is independent of all constructional features—which statement is scientifically quite wrong—and on the other side we find persons who seem to expect that every lens made gives a measurably

different degree of depth.

It should be understood that constructional peculiarities of the lens only affect depth when the object in sharp focus is near, and that the only constructional peculiarity of importance is the position of the stop, the effect of which is very small. In the case of distant objects it is correct to say that depth varies solely with focal length and aperture, provided we consider the angular and not the effective aperture, and provided the lens is quite free from spherical aberration. In these circumstances the lens should give results as regards depth in exact agreement with the calculated results given in the tables, although the presence of even a small amount of aberration will upset this agreement. In point of fact

the calculated results can only apply with exactitude to an ideally perfect lens; that is, to one that converges all the light received from a distant point to a perfect point focus, or produces a perfect cone of light bounded by straight lines. Such a lens does not exist. The image of a point is always a disk, and however small the disk may be, a close analysis of the structure of the light pencil will reveal the fact that caustics exist in it, and that it is therefore not a perfect cone. A simple test is to throw the image of the point a little out of focus and examine the small disk of light then apparent. On one side or the other of the true focus the disk will generally show a dark center bounded by a ring of light, which appearance indicates unmistakably the existence of caustics and of slight spherical aberration. In these circumstances depth must be affected, if only to a very small degree.

The manner in which depth is affected by aberration can be easily proved by anyone possessing a camera and a lens of indifferent quality. Prepare a small source of light by placing a pinhole made in a thin sheet of metal in front of an incandescent gas burner. As the experiment is only for illustration purposes, the light may be near the camera. Focus sharply on the pinhole, and then rack the camera in until the image is an appreciable disk. This disk must not be too large or the test will break down, therefore keep the disk as small as is convenient for after measurement. keeping all the adjustments of camera and light exactly the same, make a series of exposures recording the exact size of the disk with every stop of the lens, from the largest aperture possible down to the smallest. Then measure the diameters

of the disk obtained.

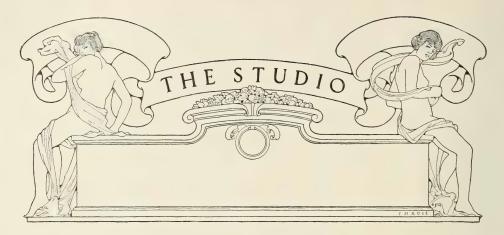
This series of disk images now represents the disk of confusion produced by each stop, and, according to theoretical laws governing depth in ideal conditions, the disk of confusion should vary in diameter in exact proportion to the size of the stop. Check the measurements against each other, it will almost certainly be found that the disks do not by any means vary in the same ratio as the stops. In one lens with which we

tried this experiment, we found not only that the ratios were all wrong, but that the two largest stops, and also the "naked" lens without any stop, gave disks of exactly the same diameter. All these stops were bigger than the one the lens was intended to be used with, but even with the stops that did not exceed the maker's maximum the ratios were completely wrong. As a matter of fact, the whole of the disks were much too small, and as a result the depth given by the lens was always considerably greater than the calculated amount. This was not a good lens at any aperture, but the conditions that prevailed as regards the disk of confusion were only exaggerated examples of what occurs to a certain extent with every lens. With a very finely corrected lens the variations may be unmeasurable, and such a lens will probably work almost exactly in accord with theory. A poor lens will depart from the theory, and give greater depth with inferior definition.

When depth varies on account of aberration, it sometimes varies differently on opposite sides of the point in sharp focus. The near depth may be increased, and the far depth diminished, or vice versa. Possible misconceptions may arise from two lenses of different character being compared, for as a rule it is near depth that is most usually considered. The difference between well and poorly corrected lenses is also often exaggerated, owing to the fine definition attainable with the former type. sets such a high standard that an amount of confusion quite tolerable with the poor lens is intolerable with the other. Therefore, as regards depth, the fine anastigmat is likely to be unfairly judged if visual tests alone are relied on.

SELECTION IN LANDSCAPE WORK

AN important element of success, in the pursuit of landscape photography is the attainment of the power of selection. When the object becomes the making of a picture, the producing of a work, which from its possessing certain intrinsic qualities giving it a wider interest, and ranking it as a work of art, more or less, it is necessary that we discriminate between the beautiful and the commonplace in nature. It will not then do to set our camera up in the first country road that we come to, and focus straight along it, being satisfied with its parallel sides, lined with stiff fencing and rows of straight-stemmed cedar trees. We must go further, and see if we cannot find a spot where nature will spread before us some of her unfettered charms—trees remarkable either for the lightness and grace which characterize some varieties, the fulness which mark others in the vigor of maturity, or for the picturesque ruggedness of decay; some sheet of water, even though it be not river or lake, where we will get mirrored reflections, sparking lights, and flat, quiet masses of shadow. If we can get a mountain peep in the distance, how fortunate! if not, perhaps we may find a rolling country, dotted with receding masses or groups of fine foliage. And our foreground; let us, if posssible, secure some variety in it-bare earth varied by patches of vegetation, rocks, stumps, and old logs, rather than flat unbroken stretches of either grass or earth. Having arrived at a point where we have found some elements of a good picture, let us so compose them, by moving from point to point, that we get our distance open and our main groups on either side; but let the group of one side be more important, if possible, than that of the other. There is nothing which makes a more picturesque contrast than a fine full mass of foliage, balancing some quaint denuded stem, festooned with vines. Our foreground should have some important feature of interest, either suitable figures or cattle, or something of striking form, or light and dark, and not precisely in the center, but generally a little either to one side or the other. It is seldom that such points can be put down in the extreme corners with good effect, as they carry the eye out too far from the center of the work.



Advertising a Photographic Studio¹

THE paper that I have undertaken to give this evening, is entitled "Some Ideas on Advertising a Photographic Studio.

When I accepted the task, I had no idea it would entail so much time and careful thought

as I had to give the subject.

To advertise is to make public, and the first advertisement that I can find is an advertisement of a sale of land; it is recorded in Ruth, in the Old Testament, in the following words: "Naomi, that is come again out of the country of Moab, selleth a parcel of land, which was our brother Elimeleck's, and I thought to advertise thee, saying: buy it before the inhabitants and before the elders of my people." I think it is quite a fitting thing that the advertising idea should

have come from the Jew.

Well, we have come together tonight to discuss the hard facts of the pros and cons of advertising our business as portrait photographers. business men, you want good, sound sense, and I have tried to give it to you in this paper. If I should fail, the pain will be mine, and the smile will be yours. This paper has not been written for photographers in the larger way of business. They have succeeded on their own lines of progress, and if they can pick up a crumb of knowledge, or a hint of value, I shall be very pleased, but I have given my attention more especially to the small man, and to the country photographer. This paper is composed of crisp, short sentences, each meant to be valuable in itself. I have avoided all padding. The photographer who takes one sentence for his guide and neglects the others will make a serious mistake.

In our case, to advertise is to get publicity, such publicity as will stimulate rumor.

General advertising is a field of commercial enterprise not to be ignored by those who are capable of handling it, and not to be attempted by the incapable.

To advertise advantageously, requires experience, judgment and a thorough knowledge of the

means employed.

A paper read before the Professional Photographers' Association of Australia by Mark Blow. (308)

Can any man say where the Receptionist and the advertisement joins up? Is not one as much a force as the other? They both exercise a persuasive influence over the prospect, and it is hard to say where the pull of the advertisement ends, and the take of the receptionist begins. They both try to get the prospect to exchange his money for your photographs.

One of the most vital factors in the photographic studio is the personal influence of the photographer himself. The cause of the preference of the customer for him is found in so many of his little attractive ways, his personality tells.

It is taken for granted that the photographer gives his best to his business, both in labor, art, and material, and for the purpose of this paper, advertising is to be taken to mean outside publicity to be obtained by various means, of which I shall deal with the following:
1. Personal influence in the business, and

especially in the social circle.

2. The show-case, the reception room, the price list, circulars, etc.

3. Newspaper and other publications.

4. Posters, signs, and other such like means. 5. Coupons, invitations, and other schemes.

1st. Personal Influence in the Business

Get seized with the idea that you mean to advertise your business by your personal means, by your commercial tact, by handling your customers with care, and by giving them of your best in every case.

You can make the personal element so potential as to force success upon your business. This is certainly the best and most lasting means of

advertising.

If you are in a country town, keep a lookout for any visitor of social, commercial, or professional importance. Get his photograph in your show-case, make it stand right away from all the other show pictures with a special announcement under it. Get up musical evenings occasionally. Have periodical exhibitions of photographs, either in your own studio or in some public place, providing light refreshments for your visitors. Exhibit in your local show and get a prize and the let the people know it for months after.

Get up competitions of different kinds, and let the prizes be photographs. Meet and know as many people as you can. A free picture to one or two whose influence is worth having, and whom you know will not talk about the gift, is a good thing.

Join every convenient public or commercial body in your neighborhood. It may pay you to join a lodge, or a tennis club, or a cricket club, a golf club, a local progress association, the school of arts, or any and every other body that you can conveniently join. Make yourself known to as many people as you can, pay courtesies, exchange courtesies, be in evidence at every public

event.

If you got a letter saying that "the photographs received are simply delightful, my friends are just charmed with them," what would you do with it? Would you just put it away as a pleasant memory? If so, you would miss the bus. What you should do is to send that customer a half-dozen business cards, with your thanks, and an assurance of equal care with any

friends they may send to you.

I know a photographer, in this city, of no mean ability, who, when he was employed as an operator, was never allowed to appear without his coat on, but when he succeeded in starting a high-class studio of his own, with speculators to back him, he almost invariably came forward in the reception room and the studio in his shirt sleeves It was only a little thing, but it had its effect. He did not last, and yet he did not know why. If people want to see men in their shirt sleeves, they need not go to a first-class studio to do so.

2d. The Show-case, the Reception Room, Price Lists, Circulars, etc.

The show-case, and other display, at the entrance to the studio, should be changed as often as possible. Every event in the town or locality should be photographed, and, with the least possible delay, prints got into the show-case. Photos of sitters taken last week should be in the show-case this week. Keep your show-cases clean and up-to-date, and don't let them shout the word carelessness.

The best advertisement is a pleased patron,

and the next is a good show-case.

The reception room should not be overcrowded with furniture or pictures. Try to strike the happy medium between a second-hand shop and a first-class waiting room at a railway station. Too much is as bad as too little, and too little is bad enough. Don't hang a lot of engravings, or oils, or water color pictures in your reception room, unless they represent your own work. Don't let your furniture talk too loudly; let your room talk photographs and talk it loudly. While a photographer's reception room should be precise, it should have some air of commercialism in it also.

We cannot over-estimate the importance of first-class business tactics in the reception room. The pleasant manner of approach, the business smile of welcome, the discreet feeling after the intentions of the customer, and the delicate influence to improve the order, are some of the

virtues of a good receptionist.

The average client who comes into your studio has a hazy dense of doubt as to whether he is to get value for his money or not, and it is some satisfaction to him to be able to see a price list, and think that he is not being got at. He then exercises his own freedom of choice with that amount of authority that satisfies him.

Advertising by circular in a general way does

Advertising by circular in a general way does not pay; unless you have a specially prepared list of names you are likely to spend money wastefully. If you send a circular to a number of people who seldom get a circular, your advertising may have good results; but if you indiscriminately take the telephone list, the directory or any other public medium of collected names, you will find a miserable shortage in your balance sheet at the end of the quarter. The intensity with which both large and small mail order houses swamp the post with circulars, makes it a nuisance to many householders, with the result that but few are read.

Be sure that your matter is good, readable, and interesting; it must have merit; it should have novelty, or it may be only a remembrancer. Remember that in many cases photographs are an extravagance. Your advertisement should so clothe the extravagance as to make it appear an economical proposition. You might suggest various reasons why your readers should spend

their money with you.

Don't say in your circulars "Get the shadow while the substance lasts," or anything else hinting at death. No one wants to be reminded of death. Such a cold sweat circular would be worthy of the waste paper basket.

Circularize those who are likely to attend your town through a land court, circuit court, a local show, a visiting show or any other attraction.

Circulars or pamphlets of local events, such as excursions, shows, the coming or going of important personages, are good for a small town photographer.

A circular or other advertisement should not be over-wordy. Quaint, curt phrases are often

telling, and of good result.

In your circulars avoid too much variety of type. Two or three faces of type are quite enough. Let your circular talk, flourishes and ornaments say nothing. A good slogan is a valuable thing.

Your circular represents yourself. Let the composition speak for you, let the type speak for you, and let the paper speak for you. Let

it be you in pamphlet form.

Form letter advertising is good when properly handled. When the typewriter came in, that kind of type had great value, but some think that a good, effective printer's type circular is now just as good.

Fac simile letters are always good when

properly gotten up.

Photographic Illustrations

Photography is, as everyone knows, the principal medium for producing nearly all the book and magazine illustrations of the present day, but the part it plays is purely a technical or mechanical one, the comparatively small number of photographs taken direct from nature

being mostly of the snap-shot variety, with the exception of those of topographical, scientific or historical interest. Of the pictures which crowd the daily papers we have nothing to say; they are records, and as such are of great value and interest; but although they may be secured at the expenditure of great labor, sometimes much risk, together with not a little skill, they lack the continuity of style and the touch of dignity essential to book illustration in its higher sense. From time to time attempts have been made to remedy this state of things, but so far with but little success. As a rule the photographer who has had the technical skill essential to the production of a successful series has been lacking in inspiration, and his pictures have been stiff and unconvincing, while on the other hand the artist who could have staged his creations has not had sufficient technical experience to photograph them, even had he not considered it

beneath his dignity to do so.

The cinematograph has now brought the possibilities of photography in this direction so clearly before us that we feel the time is approaching when a school of illustrative photographers must come into being. Doubtless in the past photographers who essayed the task were handicapped by lack of suitable models, but the cinema studio has created a new race of silent actors who can convincingly delineate any emotion and enter into the spirit of the story which is being dealt with. This work is worthy of our best artists. Millais, Frederick Sandys, even Leighton, won fame and earned money at illustration when their energies were greatest and their ideas freshest, while Cruikshank, H. K. Brown, and a host of lesser lights were faithful to illustrative work and built a lasting reputation upon it. Why should not some of our pictorialists give us a Dickens series from life? The old sharp photograph was too unreal, the pasteboard interiors and amateur actors which we all recollect in the "life model" lantern slides looked just what they were—the hand of the photographer was there, but the "producer" was non-existent Some of the old masters of slide makers, among whom Frederick York stands out, narrowly escaped complete success, perhaps mainly on account of the medium they worked in, and it would be a grave error to start at the point at which they left off.

While we cannot presume to dictate methods of production, which every artist must work out for himself, we would indicate two styles which would, we believe, lend themselves admirably to the production of original illustrations. They differ widely in their character, and each affords scope for individuality of treatment. One is the well-known sketch style which has the advantage of dispensing with all expensive backgrounds and special accessories, these being added in the usual way with the pencil or the brush, while the other method which is almost as amenable to modification is the bromoil or pigment process. By this method effects of light and shade

impossible in straight photography may be obtained with ease, unnecessary detail suppressed, and background details suggested. It would be wise to work upon a fairly large scale so that smoothness of texture could be obtained by reducing pigment prints as small as the available space on an ordinary octavo page, usually

looking rather granular.

It need hardly be said that in order to secure good proportion in groups of figures which may be several feet from front to back that a lens of greater focal length than usual must be employed and that in order to obtain the necessary depth the aperture must necessarily be rather small. Therefore a rectilinear or even one of the new fixed telephoto lenses, such as the Telecentric or Adon, will answer perfectly. A long studio is, of course, a desideratum, but in favorable weather excellent results could be obtained in an outdoor studio in which the models were posed upon a covered stage. This would permit of short exposures and ensure a more even lighting than is possible with most studios of the ordinary type.—British Journal of Photography.

Cooling the Studio

The hot weather brings with it many difficulties for the professional worker, and there are perhaps few businesses which are more influenced in various ways by climatic changes than is photography. Many of these difficulties are matters of technic, and to a great extent the manufacturer with his resources at the factory has overcome them for the worker. Frilling and blistering of plates and paper occur with much less frequency nowadays, and it is only necessary for the worker to try some of the cut-price plates sometimes offered in order to see what troubles frilling can involve, troubles almost entirely forgotten when the well-known and tried brands are in use. There are, however, other difficulties of a business character which need consideration. Hot weather inevitably affects the temper, and both workers and clients are affected in this way. It behooves the owner or manager of an establishment to counteract this as far as possible, for if the staff can be kept cool their tempers and work will be improved. It is nonsense to say that they must work, and work well, notwithstanding the heat. The human machine can only go so far. Further, the effect of a really cool studio and its appurtenances of reception and dressing-rooms on the sitters is most marked. Where electric fans can be installed they are a great help, but if fans cannot be arranged the natural ventilation must be utilized, and some form of opening skylight right in the ridge of the studio will allow the heated air to escape. If windows in the sides of the building can be opened those on the side on which the wind is blowing should be chosen, for the breeze will be slight, and a natural current of air will be obtained without any noticeable draught.—British Journal of Photography.



New Contributing Members to the Pittsburg Salon

The Executive Committee of the Pittsburg Salon, as is customary, announces the election of its new contributing members, selected from among those who were represented in the hanging at the Salon this year, whose work has been of such standard of individuality and character as to make possible their receiving this distinction. Those selected are as follows:

Fred R. Archer, Los Angeles.
C. E. Beeson, Pittsburg.
Alice Boughton, New York City.
Louis Fleckenstein, Los Angeles.
Emily H. Hayden, Catonsville, Md.
G. Buell and Hebe Hollister, Corning, N. Y.
Charles L. Peck, Buffalo.
Remick H. Neeson, Baltimore, Md.
Jane Reece, Dayton, Ohio.
Wm. S. Richter, Philadelphia.
John H. Stockdale, Baltimore, Md

Patriotic Call from Photographers' Association of America

A CALL has gone out from Washington for American photographers to enlist in the service of their country, and in that true spirit of patriotism that characterizes the professional classes everywhere since the mightly conflict began,

photographers are responding.

To further the government plan, the National Association calls upon photographers of every city and hamlet of America and Canada to meet at once and organize a section of the Photographer's Association of America. All must be members, as every man in the service is an honorary member of this organization. Send the memberships to the National Headquarters, P. A. of A., Star Bldg., Washington, D. C., together with the following information:

1. Names and local addresses of photographers of your city who have entered the Photographic Sections of Army and Navy or are otherwise

engaged in army or navy service.
2. Names of dependents, if any.

3. Are there dependents of photographers in service of your city who are in need of assistance?

4. What assistance has or will be rendered?
5. Have any in service left their business in charge of another? If so, who?

6. Give names and addresses of those who would voluntarily offer photographic service on future calls

7. Give names and addresses of those of your ladies who will furnish knitted garments that

may be required.

8. How much will your people subscribe to a fund to establish a base hospital, an ambulance and any other accessories for the direct benefit of photographers in service. There will be a separate account kept of this fund. Contributions will be acknowledged through the official journal and the fund will be extended under the direction of Hon. Frederick P. Keppel, Third Assistant Secretary of War.

9. Have all of the photographers in your

community bought Liberty Bonds?

10. Have all purchased War Stamps? 11. Are you assisting the Red Cross?

12. Give names and addresses of those who will compose a section of the Photographers' Association of America in your city.

13. Give names and addresses of officers of

ection.

14. Keep eternally at it. Meet every week and have reports sent to National Headquarters

regularly.

If you were "Over There" undergoing the hell fires of war wouldn't it give you courage and excite your patriotic fervor to feel that the members of your profession at home were doing something worth while for your benefit?

Of course it would.

Does it not appeal to your Americanism and to your pride of profession to know that the P. A. of A., with its national headquarters at Washington, is devoting its energies to war work?

Most assuredly this meets a responsive chord

in American photographers.

We are addressing you as such. Members can have the joyous consciousness of assured participation in a glorious movement to give practical help to those of the photo-

graphic profession in field, camp, or trench.
You are patriotically called for service back of the lines. There must be an immediate response. All of the other great national professional societies are gathering up their energies for a drive in the interest of their men in service. The brilliant part that photography is playing

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in winning the war for America and her allies makes it mandatory that YOU should join with this great American national organization in

doing your share.

Thousands are in the service—more are going later. Shall your name be written on the honor roll of photographers pledging themselves to support their brethern of the profession who have gone from these shores to fight for liberty?

Exhibition of the Photographic Guild of America

THE exhibition of 1918 Portfolio of The Photographic Guild of Baltimore is now being shown at the Poebody Calleries in that city.

at the Peabody Galleries in that city.

This is the third annual showing of prints by this organization, made up entirely of local contributors, and there is a marked improvement in quality, and also an increased number of prints over former shows which is most gratifying.

This sustained interest in the better kind of photography, local as it is, should be an encouragement and incentive to pictorialists all over

the country.

The methods of the Guilders are interesting: Prints are submitted and criticised by artists who are not photographers, and whose judgment is consequently not dependent upon any knowledge of the technic, thus insuring pure pictorial merit for any print accepted.

Following is a list of the contributing members:

Mrs. Chas. S. Hayden, G. Houson Payne, Jr., Harold L. Harvey, John H. Stocksdale, Frederick R. Frititta, H. Remich Neeson.

Other members not contributing this year: First Lieut. Luke R. Vickers, U. S. A. S., Blanche C. Hungerford,

J. Swing Willis.

Eastman Kodak Company of New Jersey Dividend

THE directors of the Eastman Kodak Company of New Jersey have declared an extra dividend of 10 per cent. upon the common stock of the Company, payable August 1 to stockholders of record at the close of business on June 29.

Market Conditions

When we discussed the situation two months ago, we were under the impression that conditions then prevailing would last for some time, and that it was possible to speak with some assurance of the trend for a few months, at least. But the words were hardly cold before a series of new complications arose and affairs so shaped themselves that they indicated changes along entirely unexpected lines.

The latest flurry has been in acetic acid. The news came suddenly from a clear sky that the Government had placed a restriction on acetate of lime, from which acetic acid is made. As we have learned from inquiries, chemical manufacturers must report to the Government inspector every pound of acetic acid that they manufacture, and are limited as to quantity. There do not seem to have been any large stocks on

hand anywhere, and immediately there was active bidding for all that could be found, which sent the price up by leaps. We cannot find that the price of acetate of lime has been advanced, but Government uses have made it scarce for trade purposes, and the advance seems to be more from bidding up on account of the scarcity rather than by reason of cost of production. In order to get any, it was necessary to pay the market price or do without, so, in preference to running out entirely, every one bought just as soon as the news got out.

There are rumors of scarcity in other chemicals, in fact, the air is full of rumors, but on an average only about one in five prove to be correct. Hyposulphite of soda had its own crop of rumors and hardened a little in price, but as stocks were pretty well filled up and the selling price has not advanced, we hardly expect a further advance, unless there is a decided flurry and a sharp boost. Whether it will flatten out, as many other rumors have, or become a reality is beyond our powers

of prediction.

Rumors also are out that papers, plates and films are in for an advance, but close inquiry leaves these still in the field of rumor. As these articles are perishable and are branded with an expiration date, it is not possible to stock up against an advance, but as such an advance will come without warning and also on account of the uncertainties in getting goods promptly when ordered, we believe that it would be a very wise policy for every photographer to carefully study his usual requirements and carry, on his own shelves sufficient paper, plates, and chemicals to last a month. This is not hoarding nor buying against an advance; just sound business precaution to enable the studio to turn out work without vexatious delays.

Another argument in favor of this method of stocking up is the demand for perishable goods has been so great that the manufacture has been pushed to the limit, and but little time has been allowed for the stock to ripen. It is found that papers particularly are all the better for being kept about thirty days before use, for in this time they will become set and ripe and the results are richer and clearer. Keep one month ahead of requirements, and as soon as you break into your reserve supply, order another lot for the reserve. You may get it promptly and you may be delayed, with the chances of some one item

being delayed for quite a period.

Cards and folders are high and scarce. Paper and card manufacturers in the East are hampered by supplies of raw materials and labor and transportation. The Collins line has recently announced another advance of approximately 10 per cent., and have announced that while they foresaw that such an advance would be necessary in the fall, they thought that deliveries of raw stock would be ample to stave it off until then. However, price making is arbitrary with manufacturers of raw stock, and contracts amount to nothing if supplies cannot be obtained. We are advised that prices of card stock will not be any lower for some time, and may be expected to advance slightly at any moment.

Many sundries have had price changes, and there are advances registered in view cameras, attachments for portrait cameras, backgrounds,

paste and several smaller items.

The Government is drawing the lines more strictly in the matter of explosives and volatile chemicals. We have recently received the latest Government orders and rules, which we have carefully read and find that the restrictions are quite severe. It is required that the seller of explosives shall actually see the license of the buyer, and unless the proprietor or one of his employees has seen the original or a certified copy and so reports as a matter of record, that the seller is to be held liable for violation of the law. The dealer hereafter will be compelled to have on file, either a copy of the original or a statement to the effect that a member of the firm has seen and read the original, and that such evidence shall be at the service of any Government agent at any and all times.

Highly volatile acids, such as nitric, sulphuric, etc., must be packed for shipment in separate containers, as specified by the regulations, or if packed with other goods in lots of less than a pound, shall be packed in a metal fastened tin case and surrounded with a non-inflammable material, sufficient in quantity to absorb all the contents in case of breakage. The dealer finds this somewhat expensive for small quantities, as the actual cost of packing, exclusive of the time,

is from ten to fifteen cents.

It is up to the individual to protect himself against loss and delay by buying according to his best judgment, and we will endeavor to keep the trade in touch with conditions as they arise, so that the best judgment may be exercised. We do not propose to advise by any means, nor do we claim that our information is always correct, for not always is authentic information available, and the best must be made of rumors and tips

that are offered.

But without any attempt at speculation or hoarding, we feel sure that any policy is unwise that does not do all that can be done to prevent a shortage that will cripple business. Instances are becoming more and more common where there is business in sight and people clamoring for goods, and the unprepared merchant has nothing to sell. In a conversation with a man who has recently been in Havana, Cuba, he said that there the merchants' shelves are bare, and they have nothing at all to sell; that it is impossible to get thousands of articles that one never realizes how indispensable they are until they cannot be purchased. While not so extreme in this country by reason of our widely scattered manufactories, there are local shortages here and there, and the only way to avoid serious inconvenience is to have a bit of surplus stock ahead for such eventualities.—Trade News.

The National Motion-Picture Exposition

The 1918 National Motion-Picture Exposition to be held in Boston from July 13 to 20, under the auspices of the National Association of the Motion-Picture Industry and the Motion-Picture Exhibitors' League, is expected to be the most comprehensive show of its kind ever opened. One of the big attractions will be a complete laboratory and studio in the Mechanics' Building.

Between Us

LEARN one new thing each day. If this plan is adhered to for one year your brain will have received and recorded three hundred and sixty five new impressions.

It probably will not be given to you to learn a big truth each day, but the average will be well

worth your while.

This is a good habit to acquire, as it is one that will grow upon you, and you will learn to seek

out the more important things.

Suppose you but open the dictionary and learn the meaning of one new word, you have added that much to your vocabulary, and to your understanding.

If you are passing a store window and see displayed some article with which you are unfamiliar step into the store and ask what it is, and what

it is for.

If someone with whom you are conversing makes use of an unusual word or phrase, ask the

meaning.

Do not be like the old woman of White Chapel, who threatened to sue a man for libel because he called her a "hypotenuse of a right angled triangle."

Learn one new thing each day.—The Kodak

Salesman.

A Model Dark Room

Studio Light for May contains a valuable description, fully illustrated, of a model dark room which we desire to direct to the attention of all interested who have not seen this interesting number. A copy can be had by writing the Eastman Kodak Co., Rochester, N. Y.

A Correction

Editor, Photographic Journal of America. Dear Sir.:

In the June issue of the Photographic Journal of America, page 282, under the heading of "A Modern Wet Plate Developer," you give a formula for collodion which is quite new to me, although I have used and am still using M. Carey Lea's "Collocine," but pyrocyline and sodide are products I never before heard of. No doubt it should read as I have appended here:

As published.	It should read.
Pyrocyline . 8 gr.	Pyroxyline . 8 gr.
Sodide . 4 gm.	Iodide 4 gr.
Bromide . 1 gr.	Bromide . 1 gr.
Alcohol $\frac{1}{2}$ oz.	Alcohol $\frac{1}{2}$ fl. oz.
Ether $\frac{1}{2}$ oz.	Ether $\frac{1}{2}$ oz.

It does not state what kind of iodide or bromide. Then on page 283, line 3 from top of right hand column, disk, no doubt, should be disk.

I hope you will excuse me for pointing this out, because it is an unusual error.

Truly yours,

Alfred J. Jarman.

June 5, 1918.

Philadelphia Professional Photographers' Meeting

At the monthly meeting held recently in the studio of William Shewell Ellis, 1612 Chestnut Street, the secretary, George W. Berry, stated that there is need of an association to look out for their interests because of the increase in fraudulent "agents" or "solicitors," for photographic studios.

Further, the association justifies its existence because of the need for a place where permanent exhibits may be kept illustrating the artistic

side of their work.

Continuing, Secretary Berry stated that the association's educational committee, of which W. S. Ellis is chairman, does a big work for the professional photographer in discussing the latest points on the technic of their art, and with the helpful criticisms and discussions which followed at the meeting much real good results to the members.

The business side of the meeting was concluded by the nominations for the ensuing year: President, Charles Luedecke, W. S. Ellis and J. N. Pearce; Secretary-treasurer, George W. Berry, 734 Sansom Street; Executive Committee, A. Pearlman, G. Gray, R. Bland, T. Jaffe.

The meeting finally closed with an appeal by H. Wunderlich, chairman of Photographers' Section of the Loan Committee, for aid through Those present responded with their group. \$2000.

The Cedar Point "Patriotic Service" Convention July 23, 24, 25 and 26, 1918

The Government (War Department) has designated Capt. H. A. Wildson, of the Royal Flying Squadron, to represent them. captain will have things to say and show you that will be mighty interesting. This one number will be worth going a long way for.

And the above is only one number; there will be several more that will please and surprise you; things that are practical and you will need every day as you work along. In other words, the program is going to be extra good.

Begin now to get your pictures ready for exhibition. This means you; it makes no difference how big or how small your place of business is, you are expected to send in prints. There will be a man there that you will want to talk with about them.

The diamond medal will be awarded to the

best picture this year.

A. E. RILEY, Secretary, Coshocton, Ohio.

"The Amateur Photographer" of England Merged

Messrs. Iliffe, of London, announce that they have acquired the Amateur Photographer from Messrs. Hazell, Watson and Viney, together with all the firm's other photographic publications. The Amateur Photographer is to be combined with Photography and Focus under the continued editorship of Mr. R. Child Bayley. We regret to see the passing of this old and well edited magazine.

The New England Convention

PRELIMINARY plans for the twentieth annual convention of the Photographers' Association of New England, to be held here August 20 to 23, were made in Springfield at a meeting of the association officers in Hotel Worthy. Attending the meeting were George B. Painting, of Concord, N. H., President; H. E. Bosworth, Vice-president, of Providence, R. I.; A. E. Whitney, Secretary, of Norwood, and Eugene A. Holton, Treasurer, of Boston.

The convention will include a banquet, dance and outing at Riverside with clambake. On the second day of the convention an exhibit will be opened to the public from 3 to 5 o'clock. The

usual large attendance is expected.

"Rexo Universal" Paper

Messrs. Burke & James, Inc., of Chicago, have just placed on the market a new grade of "Rexo" paper, known as "Rexo Universal." This new paper can be adopted to a wide range of negatives, and can be supplied in four regular grades in three surfaces. Further information will be supplied on application.

Pittsburg Section

At the May meeting of the Pittsburg Section No. 2 (Middle Atlantic States), the annual election of officers took place. Those elected were as follows: President, O. C. Henry; Vice-President, Mrs. Leila D. McKee; Secretary-Treasurer, J. J. Flaherty.

The meeting was held at the W. O. Breckon Studio, and was a most delightful affair. About thirty-seven were present. The whole studio was thrown open for the inspection of the photographers. After the regular business, refreshments were served. The meeting then adjourned to meet at the Don Seele Studio in June. LEILA D. MCKEE,

Secretary-Treasurer.

Stolen

Sunday, June 2, three lenses: one Bausch & Lomb photographic lens, Series 7, Serial No. 220479; one Bausch & Lomb photographic lens, Series 4, No. 5, Serial No. 37334; one Bausch & Lomb photographic lens, Series 5, No. 3, Serial No. 50956—belonging to C. J. Hibbard, 412 Nicollet Avenue, Minneapolis.

Death of Frederick C. Beach

STRATFORD, CONN., June 8.—Frederick C. Beach, inventor of the photolithic process of copying and one time editor of the American Photography, died at his home here tonight. He was graduated from Yale in 1868, was Secretary was graduated from Fale in Food, was Sectedary of Munn & Co., publishers of the Scientific American, which was founded by his father, Alfred Ely Beach; was President of the Postal Progress League of America, and one of the founders of the New York Camera Club and the Lantern Slide Interchange.



The WORKROOM

ONTAINING THE LATEST PROCESSES, FORMULAE AND APPLIANCES NEEDFUL IN THE ART OF PHOTOGRAPHY FOR THE OPERATOR & WORKER

COLOR IN LANTERN SLIDES COPYING OLD GLASS POSITIVES MAKING THE MOST OF CLD NEGATIVES STOPPERS A FINE-GRAIN FOCUSSING SCREEN ACID BLEACHES NEW METHOD OF PRODUCING TRICOLOR PRINTS THE CHOICE OF A PRINTING SURFACE CARBON PRINTS UPON ARTISTS' CANVAS WHEN IS A PLATE FIXED? PHOTOGRAPHING GROUPS CELESTIAL PHOTOGRAPHY STORING FILM NEGATIVES DIFFUSING THE FOCUS HINTS FOR THE DARK-ROOM DEGREES OF PERMANENCE IN PHOTOGRAPHIC PRINTS THE EQUAL ILLUMINATION OF THE PLATE MILDEW ON PHOTOGRAPHS AND PRINTS CARBON PRINTING AGAIN CLEARING BROMIDE AND GASLIGHT PRINTS THE KEEPING OF DEVELOPERS ENLARGEMENTS FROM SMALL NEGATIVES THE PLAYERTYPE PROCESS PHOTOGRAPHING POLISHED SURFACES SUCCESS FOR SALE



THE WORKROOM

By the Head Operator



Color in Lantern Slides

Just as there came a time when people tired of black bromide prints and strove to obtain warmer colors, so nowadays most people prefer a sepia slide to the ordinary black color usually found in commercially made slides. The production of varying colors presents no very great difficulty, and may be accomplished either during development, or by subsequent treatment. There is no question, however, that color and tone values produced by development are better than those obtained by the after-treatment of a black slide.

It has been often stated that the final color of a slide depends entirely on the length of its exposure. This statement is mostly true, but requires a little modification; because the length of time a slide remains in the developer affects its color, and the length of time of development depends not only on the exposure, but also on the amount of restrainer in the developer. However, it is near enough to say that warm color in slides is produced by long exposure developed in a developer strong in restrainer. I have been making extensive tests with Austral lantern plates, and I find the following developer gives excellent results:

Pyro	8 gr.
Bromide of Ammonia (10	
per cent.)	160 min.
Soda sulphite (10 per cent.)	$\frac{1}{2}$ OZ,
Soda carbonate (10 per cent.)	$\frac{1}{2}$ OZ.
Water to	4 oz.

This will develop four lantern plates in a whole plate dish, or an ounce of it may be used separately for each plate. Though some workers prefer to add the pyro in crystal form, it is convenient to make up the pyro in a 10 per cent. solution, preserving it with a quarter of its weight of metabisulphite of soda. It will be quite accurate enough if 1 ounce of pyro is dissolved in 10 ounces of water, in which case one would take 80 minims for the above formula. So also with the bromide of ammonia. This will keep better if distilled water is used, but it is not absolutely necessary. The sodas are simply the 1 ounce of each in 10 of water, which are usually used when developing negatives with pyro. Hydroquinone, or metol-hydroquinone, can be used instead of pyro. Caustic soda can be used with either in place of the sodas. When we want a color that gives us the best rendering of sunshine, instead of sodas as accelerator, we may use 100 minims of a 10 per cent. solution of strong ammonia (0.880). Soda sulphite is ordinarily used to prevent the pyro from staining the plate. This slight yellow stain is a help in sunny effects, hence we use ammonia.

Using Wratten lantern plates, one can get splendid tones by adding carbonate of ammonia to the developer. This formula works well:

If the amount of water be increased to 6 ounces, the time of development will be lengthened and the color of the slide will be slightly warmer.

Like nearly everything else in photography, the result depends on a more or less correct exposure. And in this case it is best to stick to one developer, and to adapt the exposure to suit For example, with an Austral lantern plate and negative of ordinary density at a distance of three feet from a 50 candle-power electric light, give a series of exposures of, say, 4, 8, 16 and 32 seconds. That is, expose the printing frame for four seconds, then with an opaque card cover up about a quarter of negative, and expose the rest for another four seconds; cover up another strip and give the rest eight seconds, and so on. Develop fully, as a good deal of detail is lost in the fixing bath. At 65° F., development may take as long as six minutes. If the factorial system is used, try 7 as the factor in the first given formula. That is, note the time that elapses between the pouring on of the developer and the first appearance of detail on the slide. Multiply that time by 7, and the result should be the time required for the development of the slide. Suppose that in sixty seconds after pouring on the developer details are becoming visible on the slide, then the total time for development would be about 60×7 seconds, *i. e.*, seven minutes. Many workers plunge the slide direct into the fixing bath without previous rinsing. In any case the fixing bath should be plain hypo, without the addition of any acid. It will be found that strong negatives, which yield too harsh a contrast in a black slide, will give a surprisingly better result by this method. As a general rule, it may be said that the longer the exposure the more restrainer (i. e., bromide) must be used, and the longer will development

We now come to the methods of turning ordinary black slides into colored ones. This may be done either by bleaching, followed by redevelopment; or by toning. Whichever method is adopted, it is necessary to start with a good black slide, that is, one which has been fully developed and is not muddy as a result of overexposure. The slide, after fixing and washing, may be bleached in one of the following solutions:

Potassium permanganate	20	oret.
Sodium chloride (commo		gr.
1.3	-	0.7
***		oz.
Water	. 10	oz.
В		
ь		
Potassium bichromate .	100	gr.
Hydrochloric acid		
		min.
Water	. 10	oz.
C		
C		
Cadium phambata	1.1	
Sodium phosphate		OZ.
Potassium ferricyanide .		
Water	. 10	OZ.
.		
D		
D	4 # 0	
Potassium ferricyanide .		gr.
Ammonium bromide (c		
potassium bromide) .	. 200	gr.
Water		oz.

B gives a certain amount of intensification, and is therefore useful when the original slide is thin. C yields a cooler color than the others. When the slide is bleached in one of the above baths, it is then well washed and is redeveloped in a soda sulphide solution. An ounce of sulphide of soda (sulphide, not sulphite) is dissolved in 10 ounces of water. One quarter of an ounce of this with 2 ounces of water makes the redeveloping bath (a convenient sulphide toner is that known as Austral sepia toner). The slide should at once darken to a rich sepia. After a few minutes' washing, it will be ready for drying. There are so many methods of toning slides

There are so many methods of toning slides that it is possible here to mention only a few. For brown tones the two agents generally used are uranium and copper. The permanence of the tones obtained by these processes is not guaranteed, but very fine colors can be obtained, ranging from sepia to terra cotta.

First, then, with uranium:

Potassi			ide		5 gr.
Uraniu		e			_5 gr.
Acetic a					50 min.
Water	 				1 oz.

Tone till the desired color is reached, then wash and dry. Too much washing will affect the color. An interesting experiment can be made by toning a slide by this means to a red color, then washing it and immersing in a weak solution of perchloride of iron. The result may be a green or a blue-gray. The formula for the copper process is as follows:

Potassium citrate .		140 gr.
Copper sulphate		50 gr.
Potassium ferricyanide		9 gr.
Water		8 oz.

Tone till the slide reaches the required color, wash and dry. I have not yet had time to experiment on a formula for a green color recently

sent me, but I give it, as it has been well recommended. Immerse the slide for five minutes in:

Potassium	ferr	icya	nide .		60 gr.
Citrate of	iron	and	ammo	nia	60 gr.
Water .					$2\frac{1}{2}$ oz.

Wash well, and leave in the following until a satisfactory tone has been reached:

Citric acid			75 gr.
Water			$2\frac{1}{2}$ oz.

For a deep blue, which also intensifies considerably, nothing is better than

Ferric chloride .		10 gr.
Hydrochloric acid		5 min
Water		1 oz.

The ordinary gold and sulphocyanide bath used for toning P. O. P. prints will give a very fine cold blue color which is very suitable for sea scenes and moonlight effects:

Ammo				ohoc	yaı	nide	20	gr.
Gold c	hloi	ide	:				1	gr.
Water							5	oz.

And, finally, a most useful word of advice as to stained fingers; and most of us, I expect, know the lasting quality of pyro stain on the human skin! This can be completely removed by dissolving a pinch of permanganate of potash in an ounce of water, adding to it when dissolved a few drops of some acid such as nitric or hydrochloric. This is applied to the fingers, and leaves them the color of a cocoanut shell, whereat one is apt to exclaim, "Woe is me!" However, there is no need for alarm. A little ordinary hypo again made acid, will remove the permanganate and leave the hands absolutely clean. The man who put me up to this dodge has on many occasions earned my warmest gratitude.—H. O. Fenton, in Australasian Photo-Review.

Copying Old Glass Positives

In most families you will find a few old portraits made on glass by the wet collodion process, probably between the early fifties and the early seventies. These old pictures are usually prized by the owners on account of their being the only portraits of departed relatives or friends. Very few of the people who own these glass positives, however, have any notion of what satisfactory copies can be made from them. In fact, photographers themselves have often been surprised at the brightness and vigor which they have been able to get in a copy made even from one of inferior quality.

It may be as well to explain what a glass positive is, because so many people, including some of the younger generation of photographers, are apt to confuse them with Daguerreotypes.

A glass positive is, in reality, a thin wet collodion negative, backed up with a dark material such as black varnish or black velvet. The lights of the picture are formed by the bright metallic silver deposit, and the shadows are represented by the black backing which can be seen through the

transparent parts of the negative. A Daguerreotype, of course, is not on glass at all; it is on a silvered copper plate.

Before copying a glass positive, it is often necessary to do a little cleaning and restoring; but nothing should be attempted in this way

which is likely to injure the portrait.

As a rule, all that is necessary is to take the picture out of its case, carefully remove the dust from the surface, and, if any of the backing has peeled off or become discolored, replace it either with fresh black varnish or black velvet. Simple as this is, it involves risks if attempted by anyone who has had little or no experience with this class of work. Occasionally, a glass positive will be met with which has been varnished on the film side with a transparent colorless varnish. In all probability, the film will have become so tender and frail that the greatest care must be exercised in dusting it: even a camel-hair brush roughly used may peel off pieces of the brittle film. Occasionally, too, one of these old photographs turns up which has the black varnish on the film side instead of on the glass side. Anyone not noticing this might easily begin scraping off the black varnish and, of course, do irreparable damage. When the black varnish is on the film side very little cleaning or restoring can be done, because the cracking of the varnish will, in most cases, have also cracked the collodion.

When all the cleaning possible has been done, the picture may be copied in the usual way, using a side light, and covering all the front of the camera except the lens with a black cloth

to avoid reflections.

Very often a glass positive is gray and flat all This is due to overexposure or fog. In a case of this kind the best way is to remove the black varnish and then treat it exactly as if it were a negative. Owing to the tender state of the film, however, contact printing will be too risky to attempt. A transparency should be made in the camera by transmitted light, and from this a negative can be made for printing in the ordinary way. When slow plates are used, and developed to increase the contrasts, a reproduction can often be made which is a great improvement on the

If the old picture looks fairly strong as a negative when the backing has been taken off, it can, of course, be used for making direct bromide enlargements. This saves all the trouble

of making a fresh negative.

There are so many of these old portraits, guarded like valuable heirlooms, that a greater business could be done in copying them if more professionals displayed examples of what they can do in this line. It should be remembered that one only of each of these old portraits is in existence: when a duplicate was wanted it meant another sitting.—Professional Photographer.

Making the Most of Old Negatives

In the present days of restricted opportunities for negative production and of increased cost of materials, it behoves amateurs to turn their attention, during the spare time they have for devotion to photography, to obtaining the best possible results from the negatives which they have taken at other and happier times. Many of these negatives will probably be found never to have been printed, or at the most to have been only rough-proofed, and, unless they have been immediately recognized as being of more than ordinary merit, have been relegated to the storage boxes without further consideration.

A period such as the present provides an opportunity for the careful consideration of these laid-by negatives, which should be examined one by one with a view of ascertaining whether, by judicious control in the printing of the whole, or a portion, some picture may be produced which

was not apparent at the first glance.

In looking over old negatives it should always be borne in mind by every careful and conscientious worker that there must have been some good reason for making the exposure present in his mind at the time of doing so. Probably, after development, the negative has been found to fall short in some respect of the aim which it was desired to attain, and in the resultant disappointment has been too hastily discarded as useless. Nevertheless the details of composition, focusing and exposure will be sure to have received proper attention, and in spite of the fact that the precise effect aimed at has not been secured, yet the negative should form a basis for the recapturing of the lost *motif* through the exercise of a judicious amount of care and control in the printing.

Those workers who confine themselves to the production of nothing larger than quarter-plate negatives will find it a good plan, instead of examining them in the hand, to put them through the lantern and inspect them, enlarged to respectable dimensions, upon the easel. Hidden beauties are often revealed by this means which would have passed unnoticed because of their occupying a small space in the negative.

Having selected a promising negative, or a portion of one, and done whatever reduction or intensification may be judged advisable, it is well to make an enlargement upon bromide paper up to, say, whole-plate size for further consideration and to act as a guide for making the finished print. Probably the sight of the enlargement will recall to memory the particular composition, lighting, or atmospheric effect which it was desired to secure at the time of exposing the plate; if so, it only becomes a question of so controlling the final plate as to obtain as nearly as possible the result originally intended. If not, the exercise of a little imagination and the careful consideration of the material to hand will result in the formation of a definite idea of what should be done to improve matters.

The next step is to subdue obtrusive detail in the guide print, and to accentuate necessary high-lights by means of the black and white bromide retouching pencils which can be obtained of any photographic dealer. Broad masses may also be subdued by black stumping chalk, rubbed on with a plug of cotton-wool, and similar masses may be lightened in tone by the use of a piece of ink eraser. The guide print should finally represent in its worked-up condition the result it is desired to attain in the finished picture. It then becomes necessary to consider what printing process is likely to yield this result in the most satisfactory manner.

Gum-bichromate, bromoil, and, if the necessary control is so small that it can be carried out on the negative itself and a good enlargement made therefrom, bromide and ozobrome all have their peculiar qualities and characteristics, one or more of which may be particularly adapted to

the work in hand.

If carbon or oil is selected, it will be necessary to make a transparency from the negative either by contact or in the enlarging lantern, the latter allowing clouds to be printed in and a certain amount of control exercised by shading, more readily than the former. Then a negative on smooth bromide paper should be made, upon which the bulk of the hand work should be done, employing for the purpose stumping chalk stumps, the retouching knife, and a little oil or Canada balsam, touched on the back very carefully with a camel-hair brush to render highlights more translucent and of greater printing value. With bromoil, if the worker has attained any degree of dexterity in the manipulation of the process, the result aimed at may be attained from a straight bromide enlargement with a minimum of trouble.

Nevertheless, it is advisable not to overtax the bromoil process too severely, and to effect as many modifications to lead to the desired end as may be in the making of the bromide base.

Though the various manipulations may take some little time to carry out, it is not so great as would be expected, and the worker should experience considerable enjoyment in the production of the finished picture, in which his artistic faculties and technical abilities have had full scope, from old negatives that have been possibly discarded.

Finally, serious work of this nature tends to check the wholesale production of prints, many of which are not worth the time or the cost of the paper spent upon them in these days when high prices are the rule.—Amateur Photographer.

Stoppers

In using glass-stoppered bottles precautions should be taken to prevent the stopper sticking, and liquids prone to give this trouble, such as solutions of the caustic alkalis, should be kept in bottles with rubber stoppers. Rubber-stoppered bottles are generally more satisfactory for most photographic solutions. When glass stoppers are preferred, the inside of the mouth of the bottle should be smeared with a little vaseline. Stoppers should never be ground in. A well-made stopper will perform its functions perfectly when loose enough to be removed and replaced by grasping with the little finger of the left hand in the usual manner of the chemist. When a stopper is found to be stuck there are several ways of dealing with the difficulty: (1) *Patience*. (2) Tapping the edge of the stopper gently on the bench. (3) Striking the head of the stopper bench. sharply with the handle of a penknife while holding the back tightly with the thumb. This should be done lengthwise with narrow-headed stoppers, such as in winchester bottles, to give the greatest resistance and lessen the possibility of knocking off the head. (4) Hot water poured on the neck of the bottle will cause the neck to

expand before the stopper. (5) Heating over a flame is a more risky variant of this. (6) A little thin oil round the mouth, warming gently for a time, and "gentle persuasion," will often move the stiffest cases.—Amateur Photographer.

A Fine-grain Focussing Screen

In copying and photomicrography, and all work where very fine focussing is essential, ordinary commercial ground glass is much too coarse in its grain for accurate work. Many processes and formulæ have from time to time been given by various workers for the home making of focussing screens by methods which involve the use of a variety of chemicals on ordinary dry plates. These methods, while in some hands affording very good screens, have the disadvantages that under the present war conditions the materials necessary are very difficult to obtain, and expensive if obtainable, and also that a certain amount of experimenting is necessary before a satisfactory screen is evolved, the "personal element" entering largely into the question. The following method, however, will be found to yield a screen with as fine a grain as could be desired, and which in addition is very simply made. Take a sheet of ordinary glass of the right thickness—ordinary negative glass will do, but plate glass is preferable—and lay it perfectly horizontal on a firm surface where it can remain undisturbed for a day or so. Then carefully cover it all over with a thin layer of ordinary milk, using just enough to cover the glass completely, and taking care that none runs over the edges. Leave it undisturbed to dry, and in a time ranging from a few hours to one day, according to the weather, the milk will evaporate, leaving a finely deposited white substance on the glass, which surface will be found admirable for focussing purposes. If this first application results in a screen which is thought to be too transparent for some purposes, a further treatment in a similar manner will strengthen the deposit and make the screen more opaque.-Amateur Photographer.

Acid Bleaches

In photography one of the most frequent causes of failure is the habit of using solutions of which the composition is doubtful owing to their having been used before. We do not know how much of this or that ingredient has been used up; and, in practice, it may be taken as certain that the best policy in the long run, in all important operations, is to avoid risks, by using fresh solutions wherever possible.

For this reason, the acid bichromate and acid

For this reason, the acid bichromate and acid permanganate bleachers possess a great advantage over ferricyanide and bromide, because they are so cheap that there is no temptation to store them and make them serve over and over again. Moreover, they are both to some extent, the permanganate especially, hypo eliminators; so that traces of hypo, which would be fatal in the presence of ferricyanide, may be ignored, particularly when permanganate is used. With bichromate I am uncertain on this point: but have a suspicion that the tone is slightly affected by the presence of hypo.

An Acid Bichromate Formula. The bichromate bleacher may vary widely in composition so far as the relative proportions of its ingredients are concerned; but the most efficient and active combination is made by taking forty minims of a 5 per cent. solution of potassium bichromate, sixty minims of dilute hydrochloric acid (pure hydrochloric acid, sp. gr. 1.16, diluted with four times its bulk of water), and adding water to make one ounce. The solution will

keep in corked bottles.

With fresh solution bleaching is complete, unless the print is exceptionally deeply printed or strongly alumed, in from one to one and a half minutes, and there is usually a faint image left. Some workers get patchiness, but this I cannot understand; it is a thing which ought never to occur. Failure in bleaching with bichromate is generally due to the yellow stain not being got rid of before sulphiding. By artificial light this stain is easily overlooked; and the result is a yellowness in the final tone, which no subsequent clearing will remove. The stain may be washed out before sulphiding; but this takes time.

An Effective Clearing Bath. The use of an ordinary clearing bath is attended with some risk; but one made as I will describe, which contains hydrochloric acid and not too much sulphite, acts quickly, and may be used with perfect safety. This clearing bath consists of a dram of a 25 per cent. solution of sodium sulphite, and a dram and a half of dilute hydrochloric acid, as just mentioned, diluted with water to make four ounces. It should be noted that if a clearing bath containing bisulphite or metabisulphite, or alum, is used, it is necessary to add a certain proportion of common salt to safeguard the image.

The clearing solution just described may be kept in a concentrated form, say four times the strength given above, and then diluted as required. It takes from one to two minutes at most, and should the action not be complete in this time, it may be taken as certain that the clearing bath is used up. It is efficient only so long as it smells distinctly of sulphurous acid. Old solution should not be strengthened or returned to the stock, but thrown away.

After clearing, the prints only require rinsing in about three changes of water, occupying about one minute, before sulphiding. The sulphide solution should be fresh, and of a strength of about two grains to the ounce. To make sure, it is just as well to finish with a second bath of fresh sulphide. The tone is exactly the same as if we used ferricyanide.

The only objection to be raised by bichromate is its poisonous action on the skin; but if prints are bleached singly there is no need to bring the solution in contact with the fingers, so that this

objection has no force.

Bleaching with Acid Permanganate. Coming to acid permanganate, an efficient and simple formula is one which can be made up as required from two stock solutions: (A) A solution of forty grains of potassium permanganate in water to make one pint, and (B) pure hydrochloric acid diluted as described above. These solutions keep indefinitely, and the bleacher is made by taking a dram of (A), from fifty to sixty minims of (B), and diluting the mixture to make one ounce.

Bleaching with this takes about one and a half minutes, and a very slight image, if any, is left. The very slight pink stain may be disregarded, and after a rinse in, say, three changes of water, occupying about one minute the prints may be sulphided direct. In order, however, that the best tone and the purest whites may be ensured, it is necessary, after the sulphide solution has been washed out, to pass the prints through the clearing bath as used for bichromate.

The only objection to permanganate is that the mixed solution will not keep, and that, if bleaching is prolonged, it may become muddy in use. Should this occur, however, no harm is done. All that is necessary is to add a little more stock solution (A) and continue the bleaching. There will be perhaps more stain, but that is very easily removed in the final clearing bath

after sulphiding.

Permanganate and Phosphoric Acid. Recently, however, the writer has worked out an acid permanganate which does not suffer from these disabilities, while it is quite as active and efficient as the mixture of permanganate and hydrochloric acid. This is also made up from two stock solutions: (A) forty grains of potassium permanganate in twenty ounces of water, as just described, and (B) two ounces of common salt, and half a fluidounce of syrupy phosphoric acid (66 per cent., sp. gr. 1.5), with water to make twenty ounces.

It is essential that the salt be free from added farina, which is present in some fancy table salts. A salt which yields a clear solution in cold water

will be satisfactory.

The working mixture consists of one dram of (A) and four drams of (B), with water to make one ounce. This quantity is sufficient for a print of about thirty square inches or less, which works out at four ounces of solution for a 12×10 inches. Should this prove insufficient, it is only necessary to add to the mixture in the disk a little more stock solution (A). The solution does not become muddy, nor does it deposit any sediment on standing. With the addition of more (A) it may, in fact, be used for several prints in succession, while in all other respects it resembles the mixture of permanganate and hydrochloric acid previously described.

Instead of the phosphoric acid, we may substitute along with the salt potassium bisulphate, sometimes called pyrosulphate, K₂S₂O₇, but the phosphoric acid is preferable. If the salt is omitted either mixture may be used instead of the usual acid permanganate as a reducer for

negatives.

Non-acid Permanganate. A solution containing half a grain of permanganate and twenty-four grains of salt to the ounce will act as a bleacher by itself. It takes about double the time of the acid mixture, leaves a considerable image free, however, from any patchiness, and causes much stain, but this yields readily to the clearing bath as used for bichromate. A most curious thing is that this non-acid permanganate invariably yields a distinctive tone, viz., a pure warm brown. It is most suitable for fairly vigorous prints and strong sunshine effects, particularly in woodland subjects. In close proximity to prints of the usual sulphide tone it tends by daylight rather to

yellowness, so that its use is indicated more for

special pictorial than for general work.

One other point should be mentioned. using acid bleachers it is necessary to avoid contact between the liquid and metals or compounds of the heavy metals. A friend of the writer could never succeed with permanganate until it was discovered that he was using dishes painted with bath enamel. All dishes must be acid-proof, or covered with acid-proof varnish. Enamelled iron, glass, porcelain, or vulcanite are perfectly safe.

As regards the relative cost, phosphoric acid being the stronger acid, works out in practice as cheaper than hydrochloric. Bichromate, if used to the point of exhaustion, is probably slightly cheaper than permanganate at present prices, but as the bichromate is unlikely to be anywhere near used up, the cheapest of all is probably phosphoric acid and permanganate, even with permanganate at \$2.50 per pound, compared with its pre-war price of 20 cents.—*Photography*.

New Method of Producing Tricolor Prints

It is generally recommended, in making the three negatives for tricolor printing, to use panchromatic plates for all three exposures. But my experience is that the best results are obtained when using plates sensitive to that part of the spectrum that is transmitted by the filter used. Thus for the yellow printer an ordinary blue-sensitive plate is best, for the red printer an orthochromatic plate, and for the blue

printer a panchromatic plate.

This system, in addition to giving a better analysis of the colors, gives a more convenient means of calculating exposures. For instance, the card issued with a box of panchromatic plates gives the multiplying factors for the three filters as: Blue five, green twelve, red ten. But by using, say, a drop-shutter plate, a verichrome plate, and a panchromatic plate of equal H. and D. sensitiveness we get factors of blue five, green seven and one-half, red seven and one-half, which are much easier and simpler to calculate accurately from the standard given by the exposure

For the development of tricolor negatives, the "B. J." pyro soda diluted five times, or the Wratten card pyro soda formula diluted three times, gives infinitely better negatives than any other reducing agent. Tricolor sets should always be developed together, and always in a tank of just sufficient capacity to take the three Tanks to hold only three or four plates are not on the market, but they are easily made. Probably some may dispute the statement that tank development is better than dish; but before saying anything for or against this statement, it is advisable to try the two methods carefully side by side.

To produce a tricolor print, it is necessary to have a print from each of the three negatives, which is, or can subsequently be made to be, a color complementary to the light-filter which screened the plate used for that particular negative. Of these three prints, two, viz., the pink and the blue, must be quite transparent; so that the colors will blend with those above and

below when the three are superimposed, in order to make the color print complete. The base print, the yellow, does not require transparency; but must be a good solid print showing the tones well, with the darker half-tones and shadow graded light to dark gray. Mr. Hamburger gave the clue to this improvement over the dead and muddy-looking carbon yellow base, with his yellow-toned bromide prints; but in those prints the darker tones are reddish, and defeat the

object aimed at.

The pink and blue elements must be quite transparent. The amount of color in each must be under perfect control; and this is another point in which the commercial tricolor tissues fail, it being almost an impossibility to obtain two films in which the color left in after development is identical when viewed by transmitted light, although by reflected light, and backed up with white paper, they look quite alike. This difficulty with transparent images judged by transmitted light is also met with in lanternslide work; and with all processes, therefore, to produce successful tricolor prints, especially in quantities, we must have the pink and blue images perfectly transparent to start with, and

dye them to a standard depth.

The idea of having transparent images and dyeing them afterward is not new; but the methods published for obtaining them have not given satisfaction, because the films contained a developed silver image, which in no circumstances could be made quite transparent. The only method by which really transparent images can be made is by carbon: but it is not possible to use a tissue of plain gelatin only, because the light would penetrate right through the more transparent portions of the negative and anchor the gelatin film to the backing paper. If the gelatin is pigmented with just sufficient manganese dioxide to stop the through-light action; then when the image is developed upon its temporary support, the pigment remaining in the print can be removed entirely by means of a 5 per cent. mixture of sulphurous acid and water, which will leave a perfectly clear and transparent image, which may be easily dyed in any quantity and to any standard. So far as I know Edgar Clifton was the first to use manganese dioxide in tricolor carbon: but his method was to mix it with the blue pigment, to dilute this and render it more transparent.

Tissue pigmented with manganese dioxide serves for the pink and the blue constituents of a tricolor image; but for the yellow constituents I use a tissue in which the gelatin is lightly pigmented with lamp black, so producing a tissue that is just sufficiently dense to prevent throughlight action. A print made with such tissue will be quite transparent in the lights and lighter half-tones, and will have a delicate visible gradation in the deep shadows, which will be gray. When this print is dyed yellow the gradations are perfect from lights to shadow, the whole

being juicy instead of muddy.

If these prints are mounted upon transparent celluloid as the temporary support; development, dying, superposition, and transfer are quite easy. With regard to the dyes used, any maker's dye may be used so long as it is a wool

dye. Judson No. 20 for the yellow, No. 34 for the blue, and No. 35 for the pink, all work well. All the images take their respective dyes quite readily, and do not easily overdye. The washing necessary to remove free dye does not reduce the dye in the image unless unduly protracted.

The tissue pigmented with lampblack lends itself to another method of making tricolor prints. For this method prints are made from each of the three negatives and developed upon celluloid; the yellow image is then dyed and afterward transferred to paper, soaked in formalin and again dried, and again soaked in water. The pink print on the celluloid is dyed in the pink dye, and when fully dyed is washed until all free dye is removed. The wet yellow print is put in contact with the pink print, and when properly superimposed the two are squeegeed in contact, placed between sheets of wet blotting paper, and under a weight for a few minutes. When the print is stripped away, the pink image will be found set off upon the yellow. The print is dried, then again wetted, and having dyed the blue image, it is mounted in contact and left between sheets of wet blotting paper and under a weight. When the print is stripped from this there will be a very delicate tricolor image.

This imbibition method will be found quite reliable as to results, because all the surplus gelatin has been removed. Consequently only just sufficient dye is absorbed for making the

images.

In my first experiments toward obtaining perfectly transparent images I made some tissue with plain gelatin, and then made up three sensitizing baths. In one was mixed the yellow dye, in the other the pink dye, and in the third the blue dye. After exposure and development the images were quite good; but in all there was a deficiency of depth of color, but this was remedied by a subsequent immersion in fresh dye. It was rather a messy operation sensitizing, and the hands were afterward quite interesting color studies, so this method has not been fully investigated, and is mentioned in case someone would care to work it out.

The print is first soaked in warm water, blotted off, laid face upward on a sheet of glass, and a little glycerin is rubbed into it, and then blotted off. The ordinary stock solution of gold chloride, of a strength of one grain to the dram of water, forms the toning bath. A few drops only of it are needed, and these are poured onto the print and at once spread all over the surface with a camel-hair brush or a tuft of cotton-wool. The action is a rapid one, and as soon as it has gone far enough the print is thoroughly washed. To prevent stains from appearing at a later stage, it is placed in an ordinary metol developer for two or three minutes, then well washed and dried.

Uranium ferrocyanide can be deposited upon a platinum print in the same way in which a bromide print is toned with it, and some very pleasant colors are obtained by that means. Ten per cent. solutions of uranium nitrate, of potassium ferricyanide, and of sodium sulphite may be made up. Half an ounce of acetic acid is diluted with water to make five ounces, and to

this one dram of each of the above solutions added in the order named. The print after toning in this is washed until the whites are quite free from any stain and then dried. This gives a very fine brown color, and at the same time interesting the print of the same time.

intensifies the print a little.

As uranium ferrocyanide was practical, I thought copper ferrocyanide, which gives such rich tones to bromide prints, might also be used with platinum; but this, so far, has not succeeded in my hands. I have tried a number of modifications of the Ferguson method; but only succeeded in altering the color of a platinum print when the whites also were stained. It is probable that any toning action that took place was due to traces of iron in the paper, and not to

the platinum image itself.

An interesting method of getting brown tones on platinum is by the Packham method. This employs Bengal catechu, half an ounce of which is boiled in a glass flask in half a pint of water for a few minutes. Two ounces of alcohol are added and form the stock solution. The toning bath consists of half a dram of this stock solution to a pint of water, and in this the prints tone to a fine warm sepia. If the bath is used hot, and especially if potassium oxalate and cane-sugar are added, the toning is rapid; but a cold solution of the catechu by itself will gradually tone the image, the action being complete in a few hours. The prints can be left in the liquid face downward undisturbed, and merely looked at from time to time until they have toned sufficiently, when they are washed and dried.—W. T. WILKINSON, in Photographic Journal.

The Choice of a Printing Surface

At the present time the photographer is catered for in the matter of surface to an extent that must be almost bewildering in its variety. The same form of sensitive medium can be obtained in over half a dozen different grades. We have the glossy, semi-glossy, platino-matt, rough, very rough, and canvas grain, and there are varieties of these varieties; while different makers' product, even under the same designations, are not always alike. Each of these has its admirers, and for each there are certain purposes or certain classes of pictures for which it is better suited than are the others. It may be possible to consider what these are, writing generally, although it will not do to lay down hard-and-fast rules, and the individual taste of the photographer must be allowed to dictate departures from any formula.

The beginner usually starts by the use of a glossy surface, and often accentuates the polish by squeegeeing the wet prints to glass or ferrotype. It is very natural that he should do so, for this method gives the finest details more perfectly than any other. It should be remembered that the rendering of detail does not depend merely upon the polish which the finished print possesses, but also upon the gloss which the paper has when it is in the printing frame. The smoother its surface the more perfect can be the contact between the paper and the film of the negative; and the closer this contact, the more faithfully is the detail reproduced. This is con-

firmed by the experience of lantern-slide makers, who hold that a lantern slide made in the camera can reproduce fine details better than one made by contact; because the optical image formed by the lens brings the image in the film of the negative into closer contact, as it were, than can be got when the rigid lantern plate itself is pressed against the rigid negative. It is also found in carbon printing that finer detail is obtained if the tissue after sensitizing is squeegeed to glass to dry; as this gives it a highly polished surface which comes into the closest contact with the negative. For both reasons, therefore, when detail in the greatest perfection is required, a glossy paper is best.

There are some cases in which it is evident that the more detail we can show the better. In such a category we should place all records made for scientific and similar objects, such as photomicrographs, architectural examples, and the wide variety of subjects which come under the head of commercial photography. In the photograph of a plant or of a piece of machinery, of a bas relief or of a coin, one cannot have too fine definition. Even if there are not fine details which it is desirable to show, there remains the fact that to indicate the texture of the different surfaces as perfectly as possible good definition is very helpful.

But the great majority of amateur photographers have not taken up their hobby to apply it to the serious purpose of scientific record: they use the camera for getting portraits of their friends, pictures of the places they visit, landscapes, and similar subjects, for which they would make no such high-sounding claims. It is as a recreation that they photograph; and the question each of them has to decide is what is the most suitable medium for their prints in such a case.

If they turn to the text-books they find in many cases that glossy papers are denounced as inartistic; while if they consult their own personal predilections they would choose these in preference to the rougher varieties. is no good reason why, in such a case, each one should not please himself. The great majority of our snapshots have, or should have, a great deal of detail: and much of the pleasure of making them comes from exhibiting them to our friends. Whatever may be the case with that limited class, the "advanced workers," there can be no doubt that to the non-photographic public the shiny surface makes a strong appeal. It is true that in its greatest perfection it is due to nothing more than the purchase of glossy paper and the use of a squeegee and ferrotype; but the photographer gets the credit for it among his friends, who praise his work for being "so clear." Clearness, in all such cases, is a merit, although a very easy one to secure. An album of travel snapshots, or the portraits of friends, will be all the better, in the small sizes at any rate, for printing upon the most glossy surface we can command.

A stage is soon reached with many workers, though, at which the matt surface seems preferable. To people of cultivated taste, even if they are not photographers, there can be no doubt that a matt picture is more attractive

than a glossy one. The shine of the surface seems to carry with it some suggestion of vulgarity, quite apart from the fact that a highly reflective surface is trying to the eyes. There is a hint of quietness or reticence about the matt surface, which is wanting in the other; and among those of our acquaintance who are of this type we shall find that their praise is more likely to be obtained by the photographs which are without any surface sheen.

The average photographer who has got past his novitiate finds that he also can admire a matt, or even for some purposes a rough, surface; without at the same time abandoning altogether his appreciation for and use of glossy We must not forget that the photographic taste of all, except the very solitary workers, is necessarily developing all the time. One is continually spurred on to do work a little better, and the standard of photographs which we aspire to emulate is one which we constantly, if unconsciously, raise. The photographer who starts with a desire to produce nice glossy chocolate-colored prints, if he perseveres, soon finds that he prefers to do work of a different character. If he belongs to a photographic society, or visits photographic exhibitions, the change is brought about very rapidly.

It is a mistake to suppose that most amateurs are not, and do not desire to be, what are called 'pictorial workers." It is only a minority, no doubt, who deliberately set out to do work of exhibition stamp; but as "The Bandit" has pointed out, our pictures of scenes and places, our portraits of our friends, are all much the better for giving consideration when making them to what may be called art principles; and there is no doubt at all that large numbers of amateurs who would disclaim all right to be called pictorial workers, do impart quality to their pictures by allowing such matters to influence them. The character of surface is only a

minor factor, but it plays its part.

While, therefore, most of us are content to make many of our prints on glossy paper, there will be a few of the choicest for which some other medium will be selected, and the question arises:

Which to choose?

The reply will depend to some extent upon the nature of the picture, and still more upon its size. If the chief reason for regarding a glossy surface as unsuitable is its reflecting character, and there is a good deal of detail which we do not wish to lose, then the character of surface known as "platino-matt" will be that to select. Except on very close examination, such prints reveal as much detail as a glossy one, although they are quite without sheen. The intermediate variety, known as "semi-glossy" or "carbon surface," may be chosen for the same purpose.

surface," may be chosen for the same purpose. But if in addition to avoiding the glaze, we have areas of shadow, which are more or less without detail owing to under-exposure; then "platino-matt" has a marked advantage over "semi-glossy." Its characteristic surface seems to suggest details even when few or none are visible: or at any rate, it does not invite a very close inspection, as the semi-glossy does, and so the want of detail is not felt. A large area of blank shadow on a glossy print, even when this has been obtained intentionally, as is often the case in portraiture, and is not merely the result of the fault of under-exposure, does not look well except in a print with a matt surface. Any gloss seems to emphasize its bareness. The larger the print, the rougher may be the surface

when this is the object in view.

There is another reason for the employment of rough surfaces, and that is to secure "breadth." When detail is not an essential of the photograph, it may be an actual blemish. Instead of allowing the composition to be viewed as a whole, with the emphasis placed where it should be, the detail (if insistent) may seriously interfere with the picture's effectiveness. There are several ways of suppressing it. One of these is to use a paper that is rough enough to obliterate the finer detail, or at any rate to damp it down. Even if it is there, the roughness of the paper compels the spectator to view the picture from a greater distance, at which the fine detail is not visible

The mistake is sometimes made of using a paper that is too rough, that is almost offensively coarse. The quality known as rough, although, as already pointed out, the character of its surface varies in different makes, is sufficiently definite for it to be said that it is only in quite exceptional cases that it is suitable for a print of less than half-plate size; while for extra rough, about 12 x 10 seems to be the minimum. These, it should be remembered, are suggestions, not

rules.

For big pictures which are to be framed for the walls—say enlargements 15 inches by 12 inches or more in size—there is no reason why the rough or extra rough papers should not be used almost always; as from the distance at which, of necessity, such pictures have to be viewed, one character of surface will look very much like another, and there will be a gain in breadth in all cases except where there is already in the negative as much breadth as the nature of the subject itself may be thought to require.

Some of the extra rough papers have a regular or mechanical grain, which is apt to be aggressive, except on very large sizes indeed: and even then, when the light falls on the picture very obliquely, it is objectionably in evidence. In such a case the grain of the paper may be almost the only thing that can be seen. As it is only now and then that the light falling on a photograph can be controlled sufficiently for this effect to be prevented: it is best to keep clear of such grades of paper. Canvas-grain papers are made, and these are suitable enough for large sizes, although subject to some extent to the same objection.

It is hardly necessary to point out that there is nothing "artistic" or otherwise in the use of rough paper. When it is deliberately adopted by the photographer to serve an artistic purpose, its use is justifiable; but unless it has a purpose, it is no more or less artistic than any other surface. It would be a strange thing if pictures could be made "artistic" by the mere device of using a rough paper for printing.—Photography.

Carbon Prints upon Artists' Canvas

In a general way carbon prints are made by direct development upon single transfer paper

from a reversed negative; but where this is not possible, where the negative cannot be reversed, then the process of double transfer must be employed, as in the case of the usual negatives made in the average work of the photographic

studio

Where the double-transfer process is employed there is no end to the various applications to which it can be put. One in particular is the transfer of a carbon print upon the oil-painted canvas such as is used by the artist for painting in oil color. Many persons in their endeavor to produce this class of work have failed mainly from the want of correct knowledge in the method of manipulation. The present article is intended to deal with this particular branch of carbon printing, embracing the essential practical points for successful working.

Large numbers of carbon prints that are imported into the United States today and produced from rare and valuable oil paintings have the effect of canvas. They, however, are not produced upon the material used by the artist. Any portrait, no matter whether head and bust, or three-quarter figure, when produced, say, in sepia and transferred to canvas will have the effect of a portrait painted in monochrome. The only near approach to this is a print made upon etching paper. Upon inspection it will be easily discovered that it is

not a canvas carbon print.

The canvas best suited for this class of work is that of the whitest kind. Some of this material has a decided stone color, of a somewhat yellowish-cream tint; this is not so well suited, because there is always a faint tinge of color in the highlights of the print to be transferred; this tones down any tendency to harshness in the highlights and produces a picture harmoniously balanced of a very satisfactory character. The canvas already attached to a stretcher can be purchased of any artist's colorman in sizes to suit any kind or size of photographic negative.

A 3 per cent. solution of bichromate of potash is well suited as a sensitizer for this class of work. The following sensitizer has been employed by the writer at all times successfully for this par-

ticular purpose:

Par Poper		
Bichromate of potash.		3 oz.
Filtered water		100 oz.
Glycerin		1 oz.
		2 dr.
Salicylic acid		40 gr.

Dissolve the salicylic acid in a few ounces of *hot* water, being a part of the 100 ounces given, and add this to the mixture at the time the salts are being dissolved. The above sensitizer must be filtered through absorbent cotton previous

The following gelatin substratum must be made, and kept ready to hand, this being a very important item for successful transfer. It should be made in the inner vessel of an oatmeal kettle, or may be made in an earthenware crock, with water boiling around it. This substratum will keep in good working condition for two weeks, if kept in a cool place.

Hard gelati	n .			٠.	2 oz.
Granulated	white	sug	ar		$\frac{1}{2}$ OZ.
Water .					30 oz.

Allow the gelatin to soak for half an hour, stir well, then add the following solution, made and used *hot*:

Chrome alum 20 gr. Water 2 oz.

This must be added to the hot gelatin solution drop by drop, stirring well at the same time. This quantity of chrome alum will not cause the gelatin to become ropy, as it is termed, or semicoagulation. Add, lastly, 1 ounce of pure alcohol, drop by drop, and stir thoroughly. This may now be allowed to stand for a few minutes to allow the air-bubbles to rise to the surface and disperse, when it may be filtered through two thicknesses of cheesecloth that has been wet and wrung nearly dry; a wide-mouthed bottle and an ordinary glass tumbler form very convenient receptacles for this purpose.

As soon as the substratum is ready and a carbon print made upon flexible support is also in readiness, the canvas must be prepared in the following way: Remove the tacks that hold it to the stretcher, lay the canvas down upon a clean board, then rub the painted side well over with a warm solution of soda, made up of

Sodium carbonate (granulated) 1 oz. Hot water 1 pint

Use a tuft of absorbent cotton dipped into the soda solution. Apply this with a light pressure, rubbing all over the surface in circles; take care not to rub the paint off so as to expose the bare canvas; wash the canvas under the faucet, and observe whether the water adheres all over the surface; if it does, the canvas is ready for use; if it does not, and is repelled upon parts of the surface, then the soda solution must be again applied until the water adheres all over evenly. The carbon print upon the flexible support must be allowed to remain in water for about fifteen or twenty minutes before attempting to transfer, so as to make the support itself very pliable.

so as to make the support itself very pliable.

The canvas must be allowed to drain well; it must then be laid back down upon a smooth board, the warm gelatin solution poured upon the surface, a large pool in the center will answer. Now take the flexible support with its print, bend it like the letter U, allow the middle to touch the center of the pool of gelatin, and lower the ends slowly. Cover the back of the flexible support completely over with a piece of India rubber cloth, and apply the squeegee from the center outward, forward, and backward; gradually increase the pressure until all the excess of gelatin mixture has been squeezed out and the canvas and its attachment lie flat.

A point of importance must now be attended to, so that the adhesion of the carbon print may be perfect from the edges inward; because, if any lifting of the transfer takes place at all it usually starts from the outside edges: Take four strips of wood, half an inch wide or five-eighths and about three-sixteenths of an inch thick, which should be previously coated with shellac varnish and dried; place these around the edges of support and canvas, *upon both sides*; these are held in position by a number of wood

clips so as to grip the canvas and support perfectly. The whole is now hung up to dry, which must not be forced by heat—from twelve to twenty-four hours is the usual time—when the wood strips may be removed. The support will now come off with ease, leaving the carbon print transferred perfectly to the carpone.

transferred perfectly to the canvas.

The next thing to be done will be to reattach the canvas to the stretcher, which is accomplished as follows: Place the canvas, back down, upon the squeegee board and flood the surface with warm water, to which about 2 ounces of the substratum mixture has been added to each quart of water, or the canvas may be dipped bodily into this. The canvas, after soaking for about two minutes, must be removed, and then dipped into clean warm water to rinse it, and drained well. Place it now, back down, upon the stretcher; adjust it in position, paying particular attention to the right amount of margin; proceed to tack the canvas at the outside edges, say along the top edge. This being done, stretch the canvas at the center of the lower edge, place a tack in the middle, and proceed in like manner all around the canvas, in precisely the same manner as it was originally attached. When this is completed place it aside to dry. When thoroughly dry it will be found to be stretched evenly and tight, and when struck upon the back with the forefinger will produce a ringing sound like the head of a drum.

While the carbon print presents the appearance of a very fine painting upon the surface in monochrome, with no tendency to split or crack, the adherence upon the oil-painted surface is all that can be desired. Such prints as these realize large sums of money to the producers and form a very lucrative branch of the photographer's

business.

If there should be any tendency to slight blistering in any part of the transferred print, it can be easily remedied by pouring over the surface a fairly hot mixture of 3 ounces of the substratum solution to a pint of water when the flexible support has first been removed, and the print allowed to dry before being treated for reattachment to the stretcher. After the canvas has become dry, any tendency to blistering will have vanished; it may now be wet as described and attached to its stretcher.

It will be advisable to allow three-eighths of an inch safe-edge to all prints from 11 x 14 up. For work of this description this will ensure a much firmer hold upon the edges of the canvas, which at all times show a great tendency to

cockle.

It will also be found that there will be no tendency for the carbon film which forms the image to chip or peel if these directions are followed. The film is not only firmly attached, but possesses a pliability that is not obtained when any hardening process is used; while at the same time such a print forms a perfect and permanent basis for working up in oil colors, and should these colors be in monochrome the resultant picture, whether portrait or landscape, will leave nothing to be desired. These pictures can be varnished or not, to suit the taste of the artist.

The process as described will answer every

purpose during the mild months of the year. In very hot weather the gelatin substratum mixture should have a few drops of a 10 per cent. solution of pure carbolic acid added when first made up, and 4 ounces less water, the chrome alum remaining the same. This addition will completely prevent any decomposition setting in and thus preserve the adhesive properties of the gelatin. Should there be, however, at any time, any signs of decomposition in the substratum mixture, discard it at once and make up a fresh batch, otherwise failure will be the result.

The bichromate sensitizer will keep for some time and may be used for half a dozen times, being filtered after each sensitizing. When, say, half a dozen batches of tissue have been prepared it will be advisable to throw the solution away and make up a fresh quantity. By attention to these little items there will be no fear of non-success, and the production of work to one's

satisfaction.

When is a Plate Fixed?

EVERY once and awhile we see appearing in our journals, among other stock articles, paragraphs on the use of two fixing baths, also stating that when a plate is immersed in hypo the silver is first changed to hyposulphite of silver and sodium, which double salt, while it is transparent and gives to the plate a transparent instead of a white appearance, still is insoluble in water; and further, that if the plate is taken out of the fixing bath the moment it clears, it will never be free from silver, and that no amount of washing will make it safe. Also that this double salt is soluble in hypo; so it is only necessary to leave it in the fixing bath long enough to effect the solution of this salt; and then comes the proposed use of this second bath, which is used to effect this latter reaction.

The above is perfectly familiar to all readers of our photographic literature. It is copied from one magazine to another, so it is hard to escape it. In regard to the use of two baths, we would say that if the first bath is fit to use at all, then it is good for both purposes. If not strong enough to dissolve the double salt, then it is not good to use for any purpose. The use of two baths reminds us much of the man who, having two dogs, cut two holes in his barn door; a large one for the big dog and a small one for the little dog. The usual advice given for fixing is to leave the plate in the hyposulphite of soda five to ten minutes after it is cleared, but no definite statement of time seems to be known. The following experiments were carried out for

this purpose:

In order to have uniform results, but one kind of plate was used, which happened to be Seed's 26x, probably an average plate. The hypo solution was made with one part of the crystals in four parts water, and a transparent glass upright fixing bath was used, to obtain exact time of

reaction.

With four plates which had not been exposed or developed, and were put into the hypo with dry films, it took five and one-half to six and one-half minutes, an average of six minutes, at which time the plates were perfectly transparent, and each one was transferred to running water as soon as cleared. With plates that had been in the developer, or had been soaked in pure water, it took just one minute longer to clear the plate. This gives an average of seven minutes for fixing plate sufficiently to make it transparent. Thermometer was 65°—and the temperature makes considerable difference; also the make of the plate has much to do with the time of fixing.

The following experiments were undertaken solely to find out how long it took the hyposulphite of silver and sodium to dissolve, and we must say that the results were not what would have been expected from the conventional

statements:

Two plates of the four above mentioned were washed in an upright bath for ten minutes, in a strong current of water, and then tested. A silver reaction was at once given, just as we would have supposed; but when the other two plates had been washed for two hours, the result

was not as we should have expected.

These latter plates, which were taken from the hypo at the moment of clearing, and had simply been washed two hours, were tested for silver; one plate by the sulphide test and the other plate by removing the wet film, incinerating it, reducing in a porcelain crucible and testing the residue for silver, one process being a check on the other. To our surprise, we found these two plates were perfectly free from silver. Then this latter experiment was repeated, giving the same result, and showing that when a plate is perfectly cleared and washed sufficiently long no silver remains in the film.

Now there is no doubt that silver and hypo will form under the right conditions a hyposulphite of silver and sodium—in fact, it forms two salts of this name, one of which is insoluble and the other is soluble. The first can be obtained by adding silver nitrate to hypo solution; the second must be obtained by removing the insoluble salt and precipitating with alcohol.

This first reaction we can see here; the latter is of no particular interest in this connection. To illustrate the formation and reaction of these two double salts we will form and dissolve them here. In this glass we have a strong solution of hypo, sufficiently strong to readily dissolve the hyposulphite of silver and sodium as soon as formed. In another beaker we have a solution of silver nitrate, which we add to the hyposulphite of sodium. You observe a white precipitate forms, which at once dissolves. This precipitate is a soluble hyposulphite of silver and sodium, and shows clearly that it dissolves instantly and completely in the reagent that precipitated it.

We now dilute the hypo to a weak solution and add the silver again. This time you observe that the precipitate does not dissolve, but quickly turns black, owing to the formation of a sulphide.

Why did we not find silver in the films that were withdrawn from the bath at the moment of clearing? Supposing a double salt has formed, and even supposing it has not dissolved while in the fixing bath, you must still remember that the film is saturated with hypo, and that this is

not removed completely for a long time while being washed, which would easily account for the silver being entirely dissolved before the plate is removed from the washing water.

But the truth of this matter is, that if a strong solution of hypo is used there is no double salt formed that is not readily soluble; but where a very weak fixing bath is used there may be danger of the hypo not being in sufficient excess to properly dissolve the silver, and in that case an insoluble salt would form.

Photographing Groups

At some time or another every photographer, whether professional or amateur, is called upon to photograph a group, and on the first occasion of doing so he is apt to find that the work has special difficulties of its own. There is not only the arrangement of the group, which is far from easy in itself, but there is the problem of dealing with a number of individuals, each of whom may have his own ideas of what is best, and some of whom may not be backward in expressing them. Then there is the fact that with such subjects a time exposure is almost always a necessity, and it only needs the movement of one of the figures to spoil the whole picture. Perhaps "picture" is not quite the right word

to use in this connection. A large group is seldom, if ever, a picture. At the photographic convention of blessed memory one of the functions was always the taking of an official group, and at one time or another many of the leading lights of the profession undertook the task of making a photograph of a hundred or so of photographers and their friends. But all, without exception, frankly accepted the inevitable, and none attempted to make a picture but merely awell, a group. Fools may rush in where these photographic angels feared to tread; but with any larger number than half a dozen or so, the amateur, if he is wise, will be content to arrange his sitters so as to get a clear view of the face of each, avoiding anything like formal rows of faces, and letting it go at that.

With smaller groups it is interesting work to try something a little higher, but one must be prepared for failures. The difficulty lies in securing a reasonable bond or link between the figures, which shall make the picture a whole and not a mere collection of individual portraits on one plate. It is generally fatal to suggest that the sitters shall appear to be engaged in some common occupation. It would need a company of first-class actors to make such an attempt a success, and the results seen in many published groups are sufficient to show this. There is sure to be a woodenness or lack of spontaneity about one or more of the components—generally more—and the whole effect seems forced and unreal.

One of the difficulties in getting a successful group is to bring the various members near enough together to prevent a straggly open effect and at the same time to avoid a bunched-up appearance. Few of the rooms at the disposal of photographers are large enough to allow much separation, but there are architectural features sometimes available which have not been used as much as they might.

A wide staircase could be made to form a fine setting for a processional group, if it happened to be so placed as to allow the camera to be kept well away from it. The ascent would allow the figures to be arranged so that each face could be well seen, while the stairs themselves would furnish a theme or motif which could run through the whole picture, and yet permit varied treatment of the individuals. Thus the foremost might be looking well ahead, others behind might show interest in one another, others again could be looking back, and so on, furnishing just that variety in unity which is so essential a quality in picture making.

Another basis for an indoor group may be provided by a table, round which some of the figures are seated, with perhaps one or two standing behind, but here there is a chance that there may be a suggestion that the side of the table next the camera has been cleared for photography. People do not usually sit up to one side of a table only, but take their places all round it, and it is not easy to deal with figures whose backs are toward the camera. Still, some good groups have been made on these lines.

Outdoor groups are often spoiled by choosing too low a position for the camera. This results in the inclusion of a sky-line, which means that the strongest contrasts in the whole picture are in the background, which, as has often been pointed out, is pictorially a mistake. If foliage or buildings come behind the group and the camera is high enough, this can be prevented. In such a case, it is helpful to keep the subject well away from whatever is behind it, and, if the lens is not an anastigmat, to arrange the sitters on a curved rather than a straight line. This will allow a larger stop to be used than is otherwise possible, and thus will facilitate a difference of definition between the group and its background, which will help to give it the proper emphasis.

In arranging a group it is always best to avoid anything like a formal disposition of the faces and hands. The heads should not come in rows, and so far as possible the position of arms and hands should be varied. One often hears the photographer of a group ask his sitters to take off their hats; but if there is a good diffused light, and the exposure is a full one, it is better not to do this, as it only serves to emphasize the strong top lighting of an out-of-doors portrait which the hats will help to minimize.—*Photography*.

Celestial Photography

CELESTIAL photography is a welcome stimulant to the photographer who may be wearied of the other branches, and now that the photographic field is rather more limited because of military restrictions, it ought to become more popular.

The stars can be photographed with any form of camera, either with a fixed focus or with a focussing arrangement, providing the lens is not too slow. The exposure necessary may vary according to circumstances, but ten or fifteen minutes has been found sufficient to secure star images, which, of course, appear upon the photographic plate as streaks, this being

due to the motion of the stars across the sky. In astronomical observatories, where star photography is part of the general routine of work, and where lengthy exposures are made, the telescopes are provided with mechanism which enables them to keep pace with the motion of the stars, but such arrangement is out of the question with an ordinary camera, which may be simply left upon the ground facing upward, or else tilted toward any part of the sky, and some arrangement made to cut off any stray artificial light around.

These star photographs may be made the basis of some very accurate star maps of the heavens, pin pricks being made either at the beginning or the end of the star streaks which

would indicate the stars.

In an ordinary camera, even if of considerable focal length, the moon would yield too small an image to be of any use, but if one has a telescope, preferably a reflector, one may obtain photographs of the moon with little trouble. The advantage of the reflector over the refractor is that it brings the visual rays and the chemical rays to a focus at the same point, whereas a refractor does not, unless specially constructed or corrected for the purpose. The lunar photographs can be taken either at the focus of the reflector mirror, or else magnified by using an eye-piece. In either case it is necessary to fit a light form of camera with a dark slide onto the telescope. A mirror of 60 inches focus will give an image about ½ inch in diameter without using any eye-piece, and with an eye-piece it can be magnified to about 3 inches in diameter and photographed either size without the telescope being mounted specially for photography. With a rapid camera plate the latter sized image has been obtained using a 6- or 7-inch telescope mirror in less than a second, this short exposure preventing any motion of the image. If it be intended, however, to photograph the moon in the focus of the mirror, and afterward enlarge the photograph obtained, it will be an advantage to use a slow plate. In most cases where it is desired to give as short an exposure as possible to avoid the blur in the image resulting from the motion, rapid plates should be used. The full moon gives more light and is more suited for a short exposure, but about the time of first and last quarter phase, or about three days before full moon, it will be found that there is more detail to be obtained.—Amateur Photographer.

Storing Film Negatives

FILM negatives tend to accumulate, especially in the case of the smaller sizes, and some system in storing them becomes necessary. Many inventions are on the market for this purpose, all more or less expensive, and the following method may be adopted with equal success, as it allows any desired negative to be found in a very few moments. The plan is to put each negative into a separate envelope, giving it a number, and making a corresponding entry in an index book. The envelopes may be had in almost the very size that the worker may require, ranging from the "seed packet," which is ideal for small film negatives up to 5

x 4 and half-plate. These envelopes should always be kept in their proper numerical order, preferably in the flat tobacco tins. One point in favor of this method is that all data appertaining to the negative may be written on the outside of the envelope, such as its exposure, details of its subject for press purposes, and various exposures on specified papers for contact printing or enlarging. The protection offered by the envelope is also of immense advantage, as, even when dry, roll-film negatives have a very delicate surface that is easily scratched or abraded. If they are enclosed and handled carefully this cannot occur.—Amateur Photographer.

Diffusing the Focus

It is sometimes wanted to secure an even softness in the definition over the entire picture, and for this a soft-focus lens is generally regarded as an essential. The present writer recently, when attempting a landscape subject, managed this by puffing a cloud of cigarette smoke across the lens during a rather long exposure. The result was an agreeable softness over the whole of the picture. This, however, needs some care, and to secure the best result a good quantity of smoke should be drawn into the mouth, and then sharply exhaled in the form of a cloud across the lens, the reason for sharp exhalation being to break up tendrils of smoke that would have a bad effect upon the picture and produce streaks. The above has been suggested before when diffusion is wished for, when using the enlarging lantern, but we have never seen it previously advocated as a valuable aid in landscape or even portrait work in securing an even diffusion over every plane in the composition.— Amateur Photographer.

Hints for the Dark-room

Labels. An ordinary gummed label soon comes off in the frequently damp atmosphere of the dark-room. Sized and varnished, it will last as long as the bottle, practically. The writer has had such labels in use for years in the acid-laden atmosphere of a chemical laboratory without their showing signs of leaving their supports. Use a thin paper, make the bottle dry, and rub the gummed and moistened label down. Then apply a coating of size (1 part of glue in 10 parts of hot water), and, when quite dry, varnish with an "oak" or "church"—i. e., a varnish containing linseed oil. Spiritous varnishes (as used for negatives) do not last so well.

For attaching the labels a mixture of glue and gum is better than gum alone. Here is a good formula which is easily made up: Soak 1 part of the best glue in water until thoroughly swollen, add a little sugar-candy, 1 part of gum-arabic, and 6 parts of water. Boil with constant stirring over a spirit lamp until the whole gets thin. The mixture does not keep; coat sheets of paper with it, let dry, and cut up into convenient sizes.

Ground-glass Labels. One of the best methods of labelling is to dispense altogether with paper labels, and instead to grind a patch on the bottle with emery powder. The formula can be written on the ground portion with lead-pencil. The

ground patch is made in a few minutes with a piece of moistened emery cloth, aided by a little emery powder. The writing is removed without any difficulty by rubbing with a piece of hard rubber. It does not wear away or become illegible in use. A coat of varnish can be applied to the patch and the writing thus made quite permanent. But the convenience of the method lies in always having the label at hand (as it were) without having to look around for paper or gum. Large bottles of stock solutions should be labelled in big, bold letters, HYPO, ALUM, etc., in Brunswick black or other good varnish paint. A solution of ordinary sealing-wax in wood alcohol is as good as anything. Grind the wax, first alone and afterward with the solvent, before applying.

Cleaning Bottles. I could easily fill pages with directions for cleaning bottles which have contained this or that chemical. But it does not pay to spend time over such business. If water does not clean the bottle right away, try shaking a little hydrochloric acid in it; if this is of no use, shake up (still with the hydrochloric acid) with shot, or small coal, or coarse sand, or something which will scrape the impurity off the side. If this fails, cast the bottle aside as useless.

Solutions that Do Not Keep. The permanence or otherwise of a solution is a matter of conditions—generally whether the air gets access to the liquid or not. Two methods of preserving solutions from the action of the air are worth bearing in mind. The first is to store the solution in a lot of small bottles, say 4 ounce capacity, each filled to the lip and well corked. The second is to store the solution in a bottle with a cork at the bottom such as is described above, and to pour a layer of "heavy" paraffin oil on the top of the solution. The oil, although designated heavy, is lighter than water, has no action on any ordinary solution, and effectually excludes the air.

Bottles for Developer. The bottles for one's set of solutions—e. g., pyro, bromide, and alkali—may very fitly be selected of distinctly different size and shape, so that they cannot be mistaken in the rosy gloom of the dark-room. As suggested some time ago, the bottle proposed for poisons, and in shape like a fashion-plate young lady—i. e., nipped in at the middle—might be adopted for pyro were it not to be feared that by a natural association of ideas the photographer might pass from clasping of the waist to pressing to the lips—with disastrous recults.

Accuracy in Weighing. There is such a thing as needless accuracy. It is no good weighing chemicals more accurately than the solutions containing them can be measured. From tests which I got some careful photographic friends to do in conjunction with personal tests some time ago, I found that in broad daylight their measurements of solutions (1 or 2 ounces) varied about 1 per cent. (1 in 100) on either side of the truth—i.e., total error of 2 per cent. Hence, weights can be safely just as inaccurate—but not more so. This means that an "ounce" of, say, potassium bromide may be $4.37 \left(\frac{1}{100}\right)$ of an ounce) more or less than an ounce without "cutting any figure." In other words, it may

be 441.8 or 433.1 grains. This means that the trouble of finally adjusting the weight to one-half a grain is simply wasted. When small quantities, 20 grains and less, are being weighed the greatest accuracy must be observed.

Seeing in Semi-darkness The glass measure has an aptitude of eluding one's vision in the dark-room. It is forced to reveal itself if we provide it with a coating of white enamel paint on its foot and around its upper outside edge. This is one of those absurdly obvious hints which the erudite miss.

When Pouring from a Bottle. Two last hints ought to be so borne in mind that the practice of them becomes habitual. Always keep the label uppermost when pouring from a bottle, so that if any liquid trickles down the side the label misses it. Result—your labels keep clean and legible much longer. Secondly, if you want to deliver drops (or a very small quantity) of liquid, just moisten the lip of the bottle with the finger. The fluid then trickles out without having to overcome the resistance of a dry patch.

Using Solutions. Under this general heading I want to say some useful things about such things as adjusting temperature, rocking solutions, cleaning dishes. As the last is a necessary preliminary (frequently), we may take it first.

preliminary (frequently), we may take it first.

Cleaning Dishes. Dirt, according to the famous definition, "is matter in the wrong place," which is very true in photography, where dirt may be various in kind. I am going to name two reagents for its removal: commercial hydro-chloric acid and paper. Commercial hydro-chloric acid is a solvent of many precipitates, sediments, deposits, which are not removed by water, and it is pretty safe to say that what is not removed by it must be rubbed off by the second reagent. Keep the spirit mixed with an equal volume of water, and see that you do not splash any of it (neat or dilute) on clothes or upholstery, for it leaves a rotten and stained patch as a memento of its visit. Dishes, measures, etc., if rinsed out once or twice with this liquid are easily made quite clean, as a general rule. Moreover, it decomposes hypo, and thus renders innocuous, as regards subsequent use, any dish which has been used for fixing. If the dish be of porous material (e.g., granatine, "porcelain"), and cracked, it is not safe to assume this, for the hypo or the acid is removed from the cracks with difficulty, though it may do so subsequently sufficiently to cause stains in, say, toning collodio-chloride prints. Moral: Keep your cracked dish, if you must keep it at all, for one particular purpose.

If the acid will not remove any stain, brisk rubbing with a tuft of any kind of paper will almost always do so. I know of no better way of cleaning right into the corners of dishes than this.

When and When Not to Filter. Do not filter if you can do anything else. It is better to let any deposit settle (if it will) and pour off the clear liquid above it. You should never filter solutions containing pyro, hydroquinone, or other developers which oxidize readily, because filtration exposes the solution so freely to the air. If it is necessary to filter it should be done before the pyro, etc., is added.

Degrees of Permanence in Photographic Prints

WITHIN ten to fifteen years ago a photograph by a "permanent" process meant one by either the platinum or carbon process. There is a very good reason why it had this signification, for during the twenty-five or thirty years during which albuminized paper was the printing method in universal use carbon and platinum prints were the only two forms of photograph which could be said to have established themselves as yielding prints of unquestioned permanence, and in this respect were distinguished from the ordinary silver prints, with their liability, particularly in later years, to fade. Opinions will differ as to what constitutes permanence, but such a formula is that no marked alteration will be observable in prints when kept under reasonable conditions for a period of, say, twenty years. This definition refers to prints belonging to the vast majority classed as portraits, views, etc. Obviously twenty years would be much too short a time for prints in which permanence is a prime considera-tion; such prints would be expected to last for fifty or a hundred years. Leaving carbon and platinum out of consideration, there can be no doubt that the most permanent form of photograph among the papers available at the present time is that on a bromide or gaslight paper. Such a print, if properly made and mounted, and preserved under suitable conditions, should meet the permanence requirement of twenty years' life. The effect of time upon it when mounted and framed should never be more than a slight yellowing of the whites, and need not necessarily be that.—British Journal of Photography.

The Equal Illumination of the Plate

One of the advantages offered by modern high intensity lenses is that it is much easier to obtain equality of illumination with them than with less rapid lenses without unduly prolonging exposure. If a lens of somewhat wide angle is being used at an aperture of f/8 there is considerable falling off of illumination, especially noticeable at the corners. This is due to the lens tube cutting off a large proportion of the oblique rays. However, if a lens of f/4.5 aperture is employed, stopped down to f/8, the rapidity is the same, and, the lens tube being a good deal bigger diameter, fewer oblique rays are intercepted. To put the matter in a nut-shell, practical workers have always found that stopping down equalizes central and marginal illumination. The high intensity lens may be stopped down very considerably, and yet be as rapid as the ordinary lens working at f/8. Thus, for certain copying work a great saving of time may be effected, and the same applies to interior exposures. From the optical point of view it is possible that a higher degree of correction may be obtained with a lens the maximum aperture of which is f/8 than with one working at f/4.5, but even if this is so, and it by no means follows, the difference when both are being used at f/8 is so slight as to be negligible. Many photographers, we find, labor under the impression that a lens of f/4.5

or such large aperture is not of service as a wide angle. In fact, at a medium aperture, it serves excellently, and for the reason we have given is superior, in this respect also, to one of smaller maximum aperture.—British Journal of Photography.

Mildew on Photographs and Prints

As photographers we are very fond of talking of the permanence of prints, as though we had no other consideration to bear in mind than the constitution of the photographic image. The effect of time with the train of deleterious influences it brings is often lost sight of. We have, for example, the enemy mildew, which attacks not only photographs, but perhaps to a greater extent engravings, water colors and other art productions. We have seen old silver prints under cut mounts, the print in a good state of preservation and the mounts speckled all over with spots of mildew. It is probable that the early photographic workers took especial care to employ pure mounting boards, paste treated with some antiseptic preservative, and, when framing their work, to paper the glass into the frame so as to exclude not only dust and moisture, but the spores or other means of propagation of the fungoid growths which we refer to as mildew. Nowadays the mounting boards commonly used are made of very poor stuff indeed, very largely of wood pulp or esparto grass, if we may judge from the rapid way in which they discolor when exposed to light. The board is surfaced with smooth paper, but we have no means of knowing what putrescence there was in the adhesive employed. It has often been remarked that any mounting board will do for carbon or platinum prints, as they are permanent, but the mildew possibility has been overlooked when this remark is made. The dry-mounting method with the water-proof shellac tissue, of course, insulates the print quite effectively, and would, we believe, be valuable in the case of water colors. -British Journal of Photography.

Carbon Printing Again

Our note on the advantages of carbon printing has drawn several comments, one writer suggesting that the trouble of printing is the chief reason why amateurs do not take up the process. This hardly seems a valid argument. The trouble of printing has not sent the oil process out of favor, because bromoil has obviated all the difficulty, and similarly those who cannot conveniently make carbon prints by contact printing can do so with the greatest ease by the ozobrome process. We think our correspondent has misstated the chief objection. Both oil and carbon seem to demand results of a certain large size, and it is the trouble of producing enlarged negatives that deters many from adopting the contact mode of printing in either case. Bromoil has successfully removed the limitations of the oil process, and ozobrome is capable of doing as much for the carbon process, only, for some reason not at all apparent, while bromoil has become popular, the far easier process of ozobrome has not. Our experience of working ozobrome has always been eminently satisfactory, and we know of no reason why the amateur should not produce carbon prints by its aid just as he produces oil prints with the aid of bromoil.

—British Journal of Photography.

Clearing Bromide and Gaslight Prints

THE following reducer is an excellent solution to keep on hand for slightly reducing and clearing up prints, clearing white edges and vignettes and the like. It is made up as follows:

Iodide	of	pot	assi	um			40 gr.
Iodin							4 gr.
Water							12 oz.

This is a stock solution that keeps indefinitely. It should be used diluted until about the color of sherry wine. For clearing up edges of prints apply with a tuft of cotton and for local reduction it may be used in the same way, followed by fixing. For clearing up a print all over, give a rapid immersion in the solution and follow by application of fixing bath and the usual washing. A little confidence and experience gained with some waste prints will enable one to use this solution to great advantage on prints that require only a little clearing up to make them satisfactory.—T. C. F., in Camera Craft.

The Keeping of Developers

Few subjects, says C. H. Bothamley in *Photography*, are of more direct practical interest than the behavior of developers on keeping, more especially after they have been made up into solutions. The matter is particularly important to those who have only to develop a few plates from time to time, for nothing is more tedious and uninteresting than the frequent making-up of small quantities of solutions. It also affects the worker, whether professional or amateur, who is continually developing comparatively large numbers of plates, because it determines how much developer he can advantageously make up at once.

In the first place, it is our experience that as a general rule, developers can be kept in their original unopened bottles for long periods of time without any sensible deterioration. The reason is that the manufacturers take care to make the packages practically air-tight, and in this connection it may be well to point out that cardboard boxes cannot afford such efficient protection as glass bottles. Tins, on the other hand, can be made air-tight without any particular difficulty.

When once the packages are opened the conditions are altered, and it requires some little skill and trouble to make them air-tight again. Fortunately, however, some of the most useful developers, such as hydroquinone, metol, and ortol, can be kept for a long time without any injurious amount of change in bottles recorked with good, soft, ordinary corks fitting well into the neck of the bottle. Pyrogallol, unfortunately, is very liable to alter, even in the solid state, and it is more satisfactory to dissolve up at once the whole contents of a bottle. If, however, this cannot be done, the cork should be well covered with melted paraffin wax. Amidol, too, alters still more readily, but,

as the solution alters still more readily, it is best on the whole to keep it in the solid state, and to get an India-rubber cork for the bottle containing it.

Developers in solution show very marked differences in their liability to alter, just as they do in their tendency to produce stains, but the two are not necessarily connected, at any rate so far as the property of staining gelatin films is concerned.

In considering this question it is well to bear in mind that the alteration is in the main, if not altogether, due to the action of the air, and consequently what we have to aim at is either to exclude the air completely or to make the conditions such that the specific action of the air is retarded or prevented altogether.

The complete exclusion of air is impracticable, for, unless the solution completely fills the bottle, which cannot be the case after part of it has been used, there must always be some air above the solution in the upper part of the bottle. All we can do, therefore, is to prevent any circulation of air in and out of the bottle, which would constantly bring in fresh air to act upon the solution. How far we can succeed in this depends, of course, on the perfection or otherwise of our means of closing up the neck of the bottle. The ordinary methods may be arranged in the following order of merit, the best thing first: India-rubber corks, good glass stoppers, good ordinary corks, bad glass stoppers. Photographers might add another proverb to those that their grandmothers taught them: "Better is a cheap cork that fits than a dear glass stopper that does not."

Coming now to the conditions that retard or accelerate deterioration, the first point of importance is that alteration takes place most readily if the solution of the developer is alkaline, and least readily if it is acid. It is for this reason that pyrogallol is always kept in an acid solution of one kind or another. Sulphites, which are now so commonly used as preservatives, act either because they are acid, as in the case of the metabisulphite, or because they absorb the active constituent—i. e:, oxygen—of the air, and so prevent its acting on the developer.

Our own experience is that the metabisulphites are by far the best preservatives of pyrogallol and other developers, and this is doubtless because they act in both of the ways just referred to. Sodium sulphite, which is so frequently used with developers other than pyro, is an oxygen absorbent, but is not acid; on the contrary, it is an alkaline salt, even when pure. Usually it is not quite pure, but contains a small quantity of sodium carbonate, and this, though in good samples the amount is small, nevertheless makes the solution distinctly alkaline, and promotes oxidation by the air. There is no reason at all, so far as we are aware, why metol or hydroquinone should not be made up with metabisulphite, instead of sulphite. If sulphite is usedand certainly it is specified in most formulæcare should be taken that it is of really good quality. The best plan of all is to decompose any carbonate that may be there by adding to the solution a small quantity of metabisulphite or of dilute sulphuric acid. In order to find

out whether any carbonate is present, you obtain from a dealer in chemicals a small quantity of the indicator called phenolphthalein and dissolve it in a mixture of equal parts of alcohol (spirits of wine) and water in the proportion of one grain of phenolphthalein to each fluidounce of the dilute alcohol. Add a small quantity of phenolphthalein solution to about an ounce of water in a tumbler standing on a sheet of white paper, and then add a small quantity of the sulphite solution. If any sodium carbonate is present, a violet-red coloration will be produced. Now to the bulk of the sulphite solution add a small quantity of dilute sulphuric acid or of metabisulphite solution, shake well, and repeat the test. If the violet-red color is still produced add a little more sulphuric acid or metabisulphite and test again. As soon as the sulphite solution ceases to produce the coloration, all the carbonate has been decomposed, and solutions of developer made up with sulphite solution treated in this way will show keeping qualities distinctly superior to those made with the ordinary sulphite containing carbonate. Another plan for reaching the same end is to weigh out, instead of every ounce of sulphite that is required by the formula, three-quarters of an ounce of sulphite and a quarter of an ounce of metabisulphite, or the same proportions with smaller quantities.

Referring now to individual developers: Pyrogallol in solution with potassium metabisulphite (10 per cent. of each) will retain its developing power practically unimpaired for months, even in bottles only partially filled. Hydroquinone and metol, or a mixture of the two, will remain practically unchanged for quite a long time when made up with ordinary sulphite, and for a still longer time with sulphite prepared in the manner described above. A change of color to yellow or orange may be disregarded. Ortol, too, made up with metabisulphite, retains its developing power and does not become discolored after several months, but amidol alters somewhat rapidly in solution, and therefore, as already stated, is best kept in the solid form.

Enlargements from Small Negatives

"AMATEUR developing and printing a specialty," such is the legend which constantly appears on the noteheads of many of our friends. Whether the photographer loves the amateur or not, he has had the business acumen to see that the amateur is anxious to spend money with those who will assist him. If the photographer had not stepped in he would not have scotched the amateur, but would have raised up someone else to do the work. Therefore, like a wise man, he took the chance himself.

In the cities, where the amateur trade is a specialty, the storekeepers are ever on the alert for some new line of profit, and this season they are working enlargements as a novelty. 10 x 12 bromide enlargements, made from clear-cut, snappy pocket kodak negatives, look very effective, and they should pay well at the price asked.

Where the photographer finds a plate which is correctly exposed (and amateurs have the wildest notions about this), he has the possibilities of successful enlargement, for the negative

should be specially made to this end, fetching out all the detail and sharpness possible, with lots of snap. It is advisable to make a negative specially with a view to enlargement where a straight order for such a print is given, but where it is a matter of using an amateur's products, the photographer must e'en do his best. What is the limit of enlargement? Some excellent enlargements have been made up to fifteen or twenty diameters. This would make from a 4×5 negative a print five feet broad. This is scarcely a likely case, but very considerable enlargement may often be accomplished. A little practice, by inspecting the negative, and also by inspecting the enlarged image, thrown on a screen, will enable the photographer to judge how far he may go. It is supposed that if a considerable enlargement is made some adequate recompense is received. We are no advocates of extortionate prices, but we do believe in a man getting a reasonable return not only for his time, but also for his skill and knowledge. In making an enlargement it is well first to make a trial on a strip of paper to judge the length of exposure required. He says: In placing the sensitive paper in position for exposure, a tin hood is used on the lens, in which is fitted a fairly deep canary glass, and if this is of the right tint, a reasonable time may be occupied in fixing up the paper and seeing that the image occupies the right position upon it without causing any deterioration or fog; but it is, of course, wise to accomplish this part of the operation with as little delay as possible. A couple of minutes or so will do no harm with fairly dense images; but, if exceptionally thin negatives are being enlarged it is prudent to insert a second sheet of yellow glass in the tin hood. Fog, however, seldom gives any trouble in enlarging when reasonable precautions are taken.

Any dodging or correcting during exposure is performed by wafting a card at a fair distance in front of the sensitive paper, and, if vignettes are required, the vignetter is placed on an upright support a short distance in front of the lens, and moved backward and forward until the shading

is seen to be as desired.

A very handy little contrivance for holding a vignetter in position between the lens and sensitive paper when enlarging is formed by using the upright rod of a microscope lamp, and sliding the cut-out, to which the tins have been applied, up and down, until it just reaches the right position. Some workers seem to shirk the vignetting of pictures in enlarging, and prefer to produce them in what is known as "solid" form, but the vignetting is quite easily performed if such a simple method of holding the vignetter, as stated, is resorted to, and in portraiture it is often a distinct improvement.

If the enlargement is very large, a new worker is apt to feel some little anxiety when it comes to development; but there is one thing fairly certain: when he has made a few successful prints he will be an enthusiast. Once he masters it there will be no difficulty. The main factors to be observed in development are the following: First have plenty of developer ready, and see that quite a plentiful supply of safe light is provided, so as to throw a sufficiency of light

over the entire developing dish, and then have at least two good-sized tubs placed in position at the corner of the dish where it has been decided

to pour off the washing water.

Have the developing dish made of tightlyjointed wood, or whatever large size may be required—we are speaking now of prints up to life size—and place in it slow cold water to the depth of an inch. The exposed roll is then taken to one end of the dish, and the operator handing over one end of it to his assistant at the other side of the dish, while he holds the other at his opposite side, the roll is equally unrolled and the paper submerged in the water slowly, care being observed that no air-bells get underneath. By slowly and deliberately unrolling the paper equally at both sides, this will be avoided. When the entire length is submerged (of course, sensitive side upward), plenty of time must be given for the paper to become equally saturated throughout. This is important, for, if care be not observed at this stage, there will be a strong liability of causing marks, by unequal development, during the next stage of the operation. In any case, it is a sine qua non that the entire sheet of paper must lie absolutely flat in the bottom of the dish. When the washing water is all run off after soaking, and prior to the application of the developer, four or five minutes may be necessary before the paper is equally saturated and expanded; then, by gently lifting the dish, the water is made to overflow into the tub that has been provided at one corner, and the whole dish is reared up on end for nearly ten minutes to drain off as much superfluous water as possible so as to ensure equal development.

If metol be employed, the plain solution is first applied copiously, and by rocking the dish and the use of a very wide camel-hair brush, it is made certain that every part of the surface has received the developer. This is then carefully poured back into the large wash basin, into which a small quantity of accelerator has been placed, and, when carefully mixed, the entire wash basinful is deftly applied to the print, and the dish rocked and the solution guided over the entire surface by means of the brush. If the exposure has been right, the shadows or dark portions will come into view in about half a minute's time, and then the entire picture develops beautifully out, any parts that hang back being coaxed up with the brush, and, if necessary, a little extra soda or potash being applied, or it may be that bromide is needed.

If all goes well, the result is something that an operator may well feel proud of, and he is sure to give vent to his feelings by such expressions as "he's a beauty." When the developer is run off, the print is rapidly sluiced with water, to be followed with the fixing solution, all of which, in plentiful supplies, must be ready at hand, and no carelessness, even at this stage, must be allowed to intervene, for it must be seen that every portion is quite fixed. The washing is then finally performed, and the print drained and hung up on the sides of the dish when reared on end, for, say, twelve hours, till quite

dry.

The mounting of these large prints is, of course,

done upon cloth. Suitable cotton sheeting can be had from any dry goods store, and this is first soaked, and wrung out, in clean cold water, and nailed upon a stretcher until practically drum-tight. The dry enlargement is then placed face downward, and, by means of a wet mop or sponge, a plentiful supply of water is applied to the back thereof, and, when the print is quite wetted equally, throughout, a good supply of stiff and cold freshly-made paste is evenly spread over its back, care being taken that the paste is quite free from any lumps by having pressed the same through a bag of coarse muslin. The print is then placed upon the stretcher and rubbed into contact, and set away to dry. When all has gone well it will dry up beautifully smooth and drum-tight.

We said that this special work should be

sufficiently well paid; the working-up is an item which cannot be overlooked. It will require both patience and experience, but with the use of a little judgment and brains, a very satisfactory result will often be obtained with two or three hours' work. If metol has been used in the development, a little ivory black and Chinese white, mixed so as to yield the color of the different densities it is desired to work up, will yield any depth, from the darkest shadow to the very verge of the high-lights, and the picture should be placed under the light of the window in the same position as it is intended to occupy

finally.

Any black spots or eyesores that may have to be removed are gotten rid of by touching them carefully with a finely pointed brush, carrying a little solution of ferricyanide of potassium and hypo, and when they are white and dry, they are easily colored to the tint of their surroundings.

The Playertype Process

[In response to many requests for a method of copying without camera or lens, we reprint from Photographic Mosaics a brief account of the process discovered by Player and named after him.]

Suppose the object to be copied is a pencil drawing mounted on a sheet of card. First lay on the table some solid firm object having a flat surface—i. e., sheet of metal, drawing board, plate glass. Next comes the mounted drawing, card downward, drawing face upward. Then a piece of slow bromide paper. This is placed film downward so that the film is in contact with the pencil drawing. On the back of the bromide paper is laid a stout sheet of glass, so as to press the bromide paper into good and even contact with the drawing. If the drawing is on a curly or stiff mount, two or more sheets of glass may be required to keep all flat. On the top of the clear glass is placed a sheet of "pot metal photographic green glass." Now, at a distance of about fifteen to eighteen inches over the middle of the pile, is arranged a No. 5 Heron's gas-burner. The exposure is about five to ten minutes. Thus, the light from the gas passes through the green glass, the sheet of plate glass, the bromide paper, the film, and onto the surface of the drawing. On development the parts of the sensitive film in contact with the white paper of the drawing

develop black, while the parts in contact with the black marks of the drawing are left white. Thus, from the positive (drawing) we get a contact negative. This is developed, fixed, washed, and dried in the usual way, and from it by contact a copy positive is made.

The developer used by Mr. Player is:

Hydroquinone			2 gr.
Soda sulphite			4 gr.
Potassium hydrat			$2\frac{1}{2}$ gr.
Potassium bromio	le		2 gr.
Water			1 oz.

If green glass cannot be obtained, results as good, if not better, can be obtained by using five or six sheets of green gelatin, such as is used for making Christmas crackers (favors).

In case of copying anything on paper with printed matter on the other side, it is advisable to place a sheet of black paper at the back to give a uniform black background.

Photographing Polished Surfaces

REFLECTIONS are sometimes a trouble to a photographer. One of the simplest ways of overcoming the reflections is to sprinkle the floor of the studio or room in which the objects are to be photographed sufficiently to render the air slightly moist. Then, when all is ready, drop a lump of ice into the vase or jug. This will chill it and immediately the moist air of the room will condense on it and dull the whole surface. The camera should be ready for the exposure (see that the lens is not clouded), for as the condensation continues it will begin to drip down the sides of the vessel. If more than one negative is required, remove the ice from the vessel till ready for the second exposure.

Another way for dealing with polished metal is to take a piece of putty—not too soft—and dab it evenly all over the bright surfaces. This will render them non-reflective and so remove the difficulty. The putty can be cleaned off and the gloss restored by means of a plate brush and whiting with a little benzole. Neither the dabbing with putty nor the using of ice can injure either glass or metal. Do not make the mistake of underexposure. Go for the shadows, and not simply for the high-lights. These will be overexposed, and tentative development should bring out the shadow detail before full density is obtained.

One of the easiest objects to copy, so far as reflection is concerned, is a Daguerreotype. The surface is so bright and so even that it reflects like a mirror—that is, it will reflect the light at the same angle that the light strikes it, and so, if only a sidelight is used to illuminate it, there will be no direct reflection into the lens of the camera.

Sometimes machinery has to be photographed.

In the case of new machinery it may be painted or varnished, according to the whim or custom of the maker. There is a period in the finishing of a machine when the parts to be painted receive a priming coat. If the photographer can take the negative at this stage, his work is rendered easier. The great trouble with machinery is often its position. A machine is a solid object and stands where it is built—that is, a photographer cannot move it at will. If the machine has to be dulled to kill reflections, paint it over with flatting color. This can be cleaned off with a handful of cotton waste, dipped in turpentine or benzoline.

In photographing silver plate we may find an inscription. Take the plate to a copperplate printer and ask him to ink the inscription. The letters, being now in black ink, will photograph much clearer, and a little turpentine on a rag

will clean the ink out.

The photographing of gold letters cut into mottled and highly polished marble—on memorials—is often difficult; in fact, if the letters are small, it is often almost impossible to read them on the stone itself, especially if the gold has partly flaked off. The best way out of the difficulty is to mix some whiting to a stiff paste with a little water and fill in the letters with it until they are flush with the face of the stone. The white matt letters will now be distinguishable in the photograph. The filling can easily be removed from the letters by either washing or brushing it out.

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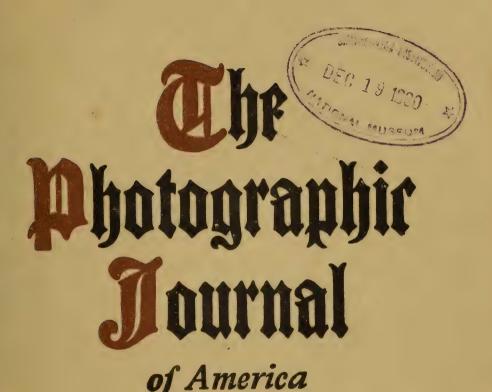
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THOMAS COKE WATKINS, Editor

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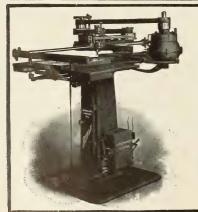
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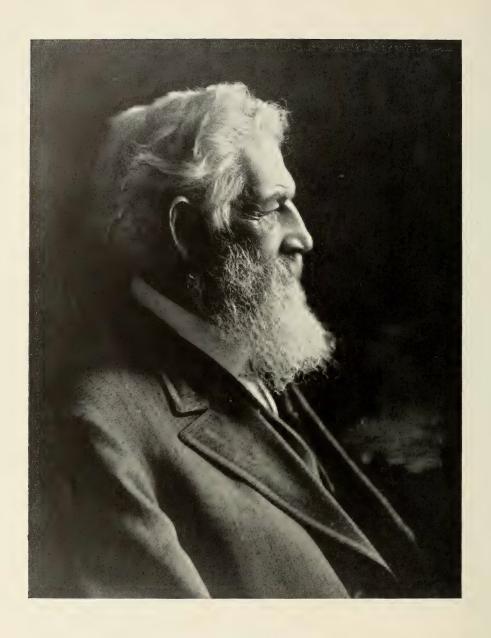
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THE INTENSITY OF THE LIGHT

By FELIX RAYMER

AFTER close observation and many talks with other photographers I have come to the conclusion that it is on this one point of lighting that they disagree so much. It is well known that operators disagree as to the strength of the light when it falls on the face of the subject.

We nearly all are of one opinion as to the direction of the light; that is from what point the light falls on the subject. But we often differ as to the amount of detail wanted in the shadows, and the strength of the high-lights as compared with the shadows.

I was once one of a party of ten operators that went to a studio in Louisville with the understanding that each was to make a sitting of some one, while the others criticised the lighting and pose. Every one had to say something either for or against the sitting. It was a noticeable fact that in nearly every case the difference of opinion came on the question of strength. One man would

say that he thought the lighting too strong, and another standing at his shoulder would say, "I do not think so, for I usually would make still stronger," and so it went. In but very few instances was there any difference of opinion as to the direction of the light falling on the figure.

As I see the matter, this question of strength in the high-lights is not a matter of principle, but one of personal preference, and the paper used for printing the picture. In some cities we find men within one or two blocks of each other that are making vastly different work, and yet who is to say that one is better than the other. One will like plenty of pluck and vigor in his negatives, while the other will want softness and detail to predominate. It is also true that each man's trade will likely come in for consideration, and he will have to make what they want to some extent.

It has been my practice to have in mind the two extremes in negative mak-

(335)

ing, and remembering them I have been able to get what I wanted with greater ease. It should be remembered that there is never a time in making a portrait that we want absolute black, and neither is there a time when we will want absolute white. This being so, if we have either one or the other the lighting will be too strong. That is, it will be too full of contrast, and will lose in roundness and softness. Therefore we are to look to the shadows and the high-lights with equal care. This is often overlooked by operators who seem to think that if the light parts of the picture are all right the entire composition will be all right. But such is not the case. It has been my experience that the shadows will require closer attention than the high-lights, for if there is any stray light in the room it will show its effect on the shadows before it will in the high-lights and will cause a loss of the modeling so necessary for a successful result.

The plan I follow in judging the strength or intensity of the light is to raise the high-lights as high as I can, making them as strong as I can, without having them throw off a reflection; that is, I do not want to lose the flesh tints in the highest light. They should never look as though they were resting on marble or glass. Let the flesh show through the very highest of them. If it does not there will have to be something done to make them softer. It is not nature to have the face so white that we cannot tell that it is flesh; nor should the picture so interpret it. There is no such thing as a white man. We have those that we call white, but they are not. The flesh will in all cases show color, and our pictures must do so.

To lower the tone of the high-lights when they are too strong I have found nothing that I like so well as an ordinary white head screen, and which can easily be made or purchased. There are those that object to the white screen, saying that it destroys modeling. This is not my experience. I claim for it just the reverse. I am sure I can do better modeling with it than without, when the high-lights are too strong. This screen in the hands of one that understands the use of it will give any effect desired, from the

very faintest reduction of the light to a flattening effect. The farther from the subject it is raised the less its effect will be noticed. Of course the nearer it is brought the lower the high-lights will become until it is possible to so flatten them that all modeling will be destroyed. It is likely that those using it and finding fault with it have had this trouble. Do not lower it any more than enough to just see the flesh begin to come into the

highest light, and then stop.

On the other hand, if the shadows do not show detail it is an indication that they will come out in the negative a black mass, which should never be allowed in portraiture. To illumine them to better advantage I am still oldfashioned enough to use a white reflector on the shadow side of the figure. I will add just here that this too has been objected to by some of our workmen. To my mind it is a good thing when used rightly. It is also claimed for the reflector that it destroys the modeling. So it does if it is not used rightly. If an operator does not know how to place it so that it will do the most good he will likely destroy the modeling. The reflector should be considered as carefully as the skylight. Do not think it can be used "any old way" successfully. It cannot. One of the easiest ways that I have found for determining when reflected light is needed is to look at the shadow cheek; if there is a sharp line formed where the light leaves off and where the shadow begins the reflector will have to be used. Now begin to draw it up to the subject very slowly keeping it well to the front, until this line has rounded out on the cheek, then If it is carried farther it will destroy the modeling.

To sum up. If there are flesh tints in the highest lights and also detail in the lowest shadow, it follows that there will be detail and half-tones in all parts that come between these two extremes.

Now this is where operators differ. One will run just as high on his highlights as he can and still have detail or flesh tints in them. This will of course bring up his shadows higher so as to be in harmony, and will result in a high key of work. The shadows must be illumin-

ated higher in order that the line formed where the light breaks on the shadow cheek may be rounded. To do this it will require a greater use of the reflector. Another operator will go in just the opposite direction, for he will make his shadows as deep as he can and still hold the detail in them. To do this he will be working in a much lower key of light, and making his shadows so deep will cause the high lights to take on greater contrast by comparison, which will give a much dtronger effect. But which is right? As I see it, both are right. The only difference being that one likes a high key of light and the other the low

As a rule the operator working in the low key is the one that likes to show the character in the face, bringing out as many of its little individual markings as possible. To do this he will lower his shadows, and in doing so will concentrate the light at some parts of the face stronger. In this way he will secure the accentuation of those parts, holding them up to their proper weight as compared with certain other parts that are not of so much importance.

The operator making the high key of work is usually the one that prefers to idealize his subject. He will in most cases flatter (?) her in the lighting, if possible, as well as in the retouching.

The key of light must be lowered by the use of opaque screens, or shades. It cannot be done by using white shades or curtains. They only serve to filter the light, and will merely soften it. principle of lowering the key of light is to make the shadows longer. It is the same as a match compared to an arc light when held within three or four feet of a head. The match will throw a longer shadow than will the arc light. Now, the idea of concentration, is to use opaque curtains or screens so as to make the actual working opening in the light smaller, and at the same time move the subject nearer to it; in doing so the highlights will still hold their own, remaining at the same strength, thus giving a stronger result. If we bear this in mind we need have no trouble in getting our light too strong or too flat. Use opaque screens if more strength is desired, thus accentuating certain parts, and subordinating certain other parts. Use white shades or curtains for making a softer result with less accentuation, as the light is filtered through them and will fall on the subject with less force.

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IF YOU HAVE TO
GIVE IT AWAY
THE SENSATION
IS WORTH WHILE

A NEW METHOD OF OBTAINING DYETONED IMAGES BY THE USE OF COPPER FERRO-CYANIDE AS A MORDANT

By J. I. CRABTREE

ALTHOUGH numerous methods have been worked out for toning lantern slides and motion-picture film by replacing the silver image either wholly or partially by a colored inorganic compound, owing to the limited number of colored inorganic compounds available, only a very incomplete range of tones can be obtained in this way.

It has long been considered that if the silver image could be converted into a compound capable of fixing or mordanting a dye in proportion to the density of the image, that this would be the ideal method of toning. Accordingly numerous experimenters have made a deliberate search for such mordants (See British Journal, 1911, p. 607), and the first worker to evolve a practical process was Traube, who took advantage of the mordanting action of silver iodide for certain basic dyes and obtained dye images by first bleaching the silver image to silver iodide in a suitable bleaching bath, and then immersing the bleached and washed image in a solution of the dye. When producing dye images in this way, it is necessary either that the dye shall not be absorbed by the gelatin readily, or that it will easily wash out again in order that clear high-lights may be obtained.

Owing to the relatively high opacity of a silver iodide image when produced in an emulsion of average grain size, the dye image obtained in the above manner exhibits very little color when projected, so that it is necessary to remove some of the iodide without removing the dye by fixing in a solution of hypo containing tannic acid and other salts, which render the dye insoluble. If all the iodide is removed in this way the residual dye

¹ Communication No. 72, from the Research Laboratory of the Eastman Kodak Company. The patent rights to this method are being secured by us, but it may be freely used for toning motion-picture film manufactured by the Eastman Kodak Company.

image is usually too thin for projection though by only partially fixing, tolerably good tones are obtained. The action of the hypo is, however, not proportional, attacking the high-lights more than the shadows, so that double tones are obtained.

In view of the above objections to the Traube process, experimenters have attempted to secure transparent tones directly without subsequent fixing, the most recent process being that of Miller (United States Patent, No. 100,098), which consists in bleaching the silver image in a mixture of potassium iodide and iodine containing an excess of potassion iodide, with a view to producing a transparent modification of silver iodide capable of mordanting in the usual way.

The following experiments are the result of a systematic search by the author for mordants other than silver iodide, which would give a transparent image on projection.

The Mordanting Action of Copper Ferrocyanide

As a result of numerous experiments it was found that an image containing copper ferrocyanide, obtained by toning in the usual copper toning bath, exerted a powerful mordanting action and was capable of producing excellent dye images.

The usual copper toning bath consists of a solution of copper ferricyanide dissolved in a suitable solvent such as a solution of an alkaline salt of citric, tartaric, or oxalic acid together with other salts. On immersing the silver image in such a bath the silver reacts with the copper ferricyanide and is converted to silver ferrocyanide, while copper ferrocyanide is formed simultaneously in combination with the image.

 $\begin{array}{l} 4 Ag + 2 Cu_3 (Fe(CN)_6) 2 = Ag_4 Fe(CN)_6 + \\ 3 Cu_2 Fe(CN)_6 \end{array}$

On immersing this image in a solution of a suitable basic dye a composite image is obtained consisting of a mixture of silver, silver ferrocyanide, copper ferrocyanide and the dye. The silver ferrocyanide may be removed from the toned image by treating with a solution of caustic soda when an image consisting of copper ferrocyanide and silver is left, and in turn the silver ferrocyanide may be removed with a 10 per cent. solution of hypo, leaving an image of copper ferrocyanide with more or less silver. On immersing the separate copper and silver ferrocyanide images thus prepared in the dye bath after well washing, only the copper ferrocyanide was found to exert any appreciable mordanting action.

The method of procedure was to first tone the silver image in the copper toning bath, wash and then immerse in the dye bath until the desired color was obtained. The nature of the tone was found to depend on the following factors:

Nature of the Copper Toning Bath

The formula for this is given under "Practical Instructions."

Although many of the usual formulae for copper toning will produce a dye image, it is necessary that the toned image should be as transparent as possible so as to eliminate the necessity of subsequent fixing. The formula appended gives very transparent tones.

Nature of the Positive to be Toned

This should be free from hypo so as to remove any possibility of the image being reduced by the ferricyanide in the toning bath. When toning in the copper bath little or no intensification takes place, though as certain dyes, such as methyl violet, are very heavily mordanted it is necessary to choose a positive somewhat thinner than the average according to the degree of intensification produced during dyeing. Full details are given under "practical instructions."

Time of Toning

The time of toning determines the proportion of copper ferrocyanide in the toned image, which reaches a maximum in from ten to fifteen minutes. If only pale tones are required the image is

toned for only two or three minutes in the copper bath, while if a full tone is required the copper toning is carried to completion.

Time of Washing after Toning

It is necessary to wash sufficiently long for the soluble copper salts in the toning bath to be removed, otherwise the dye would be mordanted on to the high-lights and stain them. Usually ten minutes is sufficient, though prolonged washing does no harm, since the copper ferrocyanide is insoluble in pure water.

Nature of the Dyes Employed

In general only basic dyes are mordanted, and only those which do not readily dye gelatin and which are mordanted by copper salts are suitable for toning by this method. The following dyes have been found satisfactory:

Tannin heliotrope,

Thioflavine,

Victoria green,

Methyl green,

Methylene blue,

and the following dyes manufactured by the National Aniline & Chemical Company, Inc., New York City:

Safranine,

Chrysoidine,

Methyl violet.

Dyes manufactured by different makers differ somewhat in their behavior toward gelatin and toward mordants, so that it is necessary to make a preliminary trial with each new sample of dye.

Concentration of the Dye Bath

Only a very weak dye bath is necessary, and this should not be stronger than 0.1 per cent. A stronger dye bath gives badly stained high-lights, necessitating long washing to clear them, while with a weaker bath the dye is absorbed very slowly or not at all.

Effect of Adding Acid to the Dye Bath

The addition of acid to the dye bath has the effect of increasing the rate of dyeing in some cases and of decreasing it in others; in the case of the dyes given above the addition of acid appears to diminish the rate of absorption of the dye by the gelatin, so that by using acid a stronger solution may be employed without the high-lights being stained. If the concentration of the dye is increased to any great extent beyond the amount stated, stained high-lights are obtained.

Time and Temperature of Dyeing

The amount of dye absorbed by the image, and therefore the strength of the tone, varies with the time of dyeing, reaching a limit in from five to ten minutes. The time of dyeing is also slightly affected by changes of temperature, though slight changes are of no moment.

Time of Washing after Dyeing

This varies according to the degree of staining of the high-lights and the fastness of the dye to washing. In the case of the examples below only a mere rinse in pure water is necessary to clear the high-lights, though if the high-lights are stained they may be cleared by washing in a 0.2 per cent. solution of acetic acid. Too high a concentration of acid in the wash water should be avoided otherwise reticulation and frilling of the gelatin is liable to occur, especially if the temperature is above 70° F.

Effect of the Size of the Image Grain on the Transparency of the Tones Produced

The transparency of the tones is determined by two factors: (a) The nature of the copper toning bath. The composition of the bath recommended has been so adjusted as to give the maximum transparency. (b) The size of the silver grains of the image to be toned.

Previous investigators appear to have ignored the effect of grain size on the transparency of the toned image. Experiments were made with emulsions of varying grain size, and it was found that with lantern-slide emulsions of very fine grain, such as give warm tones by direct development, very transparent images were produced after toning and dyeing as above without any subsequent fixing whatsoever.

However, a toned image for purposes of projection should not be too transparent otherwise it lacks brilliancy, so that the tones obtained on say the "Standard Slow" lantern slide plate and on Eastman motion-picture positive film by the following methods are satisfactory:

Stability of the Dye Tones

The dye tones recommended proved to be fast to light, no change in color being noticeable after exposure to a quartz mercury vapor lamp for five hours at a distance of eighteen inches.

Practical Instructions for Toning Lantern Slides and Positive Motion-picture Film; Nature of Positive

Since the following toning processes intensify the original image it is necessary to commence toning with an image of the correct density and contrast. A "medium" positive referred to below is obtained by giving a slight over-exposure and a short time of development, but the exact degree of intensification which takes place in any particular case will be learned after a few trials.

In the case of lantern slides the best and most transparent tones are only produced on slides of fine grain, such as the Eastman Standard Slow lantern plate.

Tone I. Red Tone. Positive employed: medium. Tone the well-washed positive in the following:

Avoirdupois.	Metric.
Copper sulphate 250 gr.	16 gm.
Ammonium citrate (neu-	
tral) 1 oz 300 gr.	50 gm.
Potassium ferricyanide . 240 gr.	16 gm.
Ammonium carbonate . 120 gr.	8 gm.
Water to 1 gal.	4 liters

Dissolve each ingredient separately in as little water as possible, mix the filtered solutions so obtained in the order given and dilute to the required volume. The solution obtained should be light green in color and perfectly clear. The ammonium carbonate should be almost transparent and free from white powder, and should be dissolved in cold water, while the ammonium citrate employed should be neutral. Most samples contain acid, which acid would neutralize the ammonium carbonate and affect the resulting tone. The free acid is usually citric acid, and should be neu-

tralized with a solution of ammonia using litmus as indicator.

Somewhat warmer tones are obtained by adding 50 per cent. more potassium

ferricyanide to the formula.

Life of Bath. With use the bath precipitates a brown sludge of copper ferrocyanide and in consequence becomes weaker by the loss of copper.

Time and Temperature of Toning. Five to fifteen minutes at 70° F.

Time of Washing. Ten minutes.

It is important to keep the bath covered when not in use so as to exclude light, since the bath is light sensitive, while no foreign metallic surface should be allowed to come in contact with the solution, otherwise the copper salt will deposit on the metal.

After washing immerse in the follow-

ing dye bath:

	Avoirdupois.	Metric.
Safranin-A (National Ani	-	
line & Chemical Com	-	
pany, Inc.)	. 60 gr.	4 gm.
Acetic acid (glacial) .	$\frac{2}{3}$ OZ.	20 c.c.
Water to	. 1 gal.	4 liters

Time of Dyeing. Five to ten minutes, according to depth of tone desired.

Time of Washing after Dyeing. Usually only a slight rinse in water is necessary. If the high-lights are stained the positive should be washed for five to ten minutes or until clear. Stained high-lights are caused either by insufficient washing after toning, too strong a dye bath or an incorrect amount of acid in the dye bath.

Tone 2. Orange Tone. The instructions are exactly as for Tone 1, substi-

tuting the following dye bath:

	Avoirdupois.	Metric.
Chrysoidin 3R (National	1	
Aniline & Chemical		
Company, Inc.)	24 gr.	1.6 gm.
Acetic acid (glacial) .	$\frac{2}{3}$ OZ.	20.0 c.c.
Water to	1 gal.	4.0 liters

Tone 3. Violet. The instructions are exactly as for Tone 1, substituting the following dye bath:

Avoirdupois. Metric. Methyl Violet (National

Aniline & Chemical Company, Inc.) . . . 24 gr. 1.6 gr. Acetic acid (glacial) . $\frac{2}{3}$ oz. 20.0 c.c. Water to 1 gal. 4.0 liters

Intermediate Dye Tones. The depth of the dye tone is determined by the time of immersion both in the coppertoning bath and in the dye bath. Pale tones may therefore be obtained either by giving a short bath in the copper solution and fully dyeing or by toning for a longer time and giving a short immersion in the dye bath.

By mixing the dye baths 1, 2, and 3 intermediate colors may be obtained.

Tone 4. Pale Red. Positive Employed: normal. Tone for one or two minutes in the copper bath, wash for ten minutes and then immerse in the following dye bath:

Dye solution for Tone 1, one volume. Dye solution for Tone 2, one volume. When the desired tone is obtained rinse until the high-lights are clear.

Compound Tones

Tone 5. Copper, Iron, Dye Tone. By first partially toning the black and white positive (medium) in the copper bath so that the half-tones are completely toned but the shadows only partially, washing for ten minutes and then completing the toning process in a blue toning solution the residual silver in the shadows is toned blue. In this way a double tone is obtained, the shadows appearing dark blue and the half-tones reddish brown.

By immersing the positive toned in this manner in the chrysoidin dye bath as given under Tone 2 the dye is mordanted to the half-tones which contain copper ferrocyanide, producing a striking double tone effect.

A suitable blue-toning bath formula is as follows:

	Avoir	dupois.	Metric.
Potassium bichromate	$1\frac{1}{2}$	gr.	0.1 gm.
Ferric alum (ferric am	-		
monium sulphate)	. 75	gr.	5.0 gm.
Oxalic acid		gr.	12.0 gm.
Potassium ferricyanide	. 60	gr.	4.0 gm.
Ammonium alum .	. 360	gr.	20.0 gm.
Hydrochloric acid, 10)		
per cent	. 65	min.	4.0 c.c.
Water to	. 1	gal.	4.0 liters

The method of compounding this bath is very important. Each of the solid chemicals should be dissolved separately in a small quantity of warm water, the solutions allowed to cool, filtered strictly in the order given and the whole diluted to the required volume. If these instructions are followed the bath will be a pale yellow color, perfectly clear and will remain so for a considerable period.

Troubles in Dye Toning

A. Stained high-lights are due either to insufficient washing after toning in the copper bath, too strong a dye bath or an incorrect amount of acid in the dye bath.

B. Weak high-lights. If the high-lights do not absorb the dye proportionally, this is due to the use of an exhausted copper bath or of one that was not mixed correctly.

Summary

Lantern slides and motion-picture positive film may be toned by replacing

more or less of the silver image by a compound of copper, particularly copper ferrocyanide, washing and then immersing the toned image in an acid solution of a basic dye. The copper salt present in the image acts as a mordant to the dye, and a toned image is this produced of a color intermediate between that of the dye and the copper compound, depending on the relative proportion of each. The amount of the copper salt necessary to mordant the dye is usually so small that the resultant tone differs but slightly from that of the dye itself.

By employing a mixture of dyes intermediate tones may be obtained, while by commencing with a black and white image of fine grain very transparent

toned images are produced.

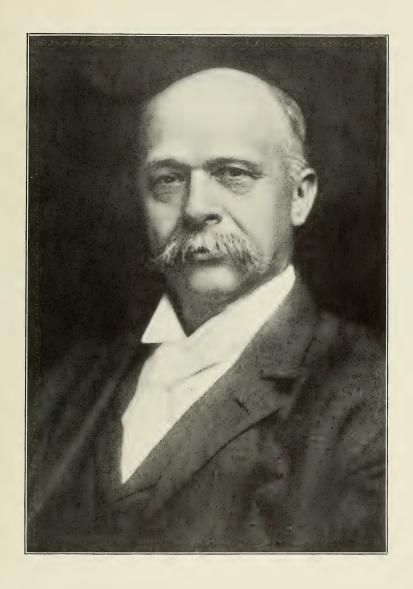
The author is indebted to Mr. S. Tulpan for assistance in carrying out the various experimenst.

THE TREND OF PHOTOGRAPHY

As the war progresses we see some new development of photography in the way of added usefulness and greater necessity, and it offers to the imagination the possibilities of a bigger future for the art than it has ever enjoyed before. There seems to be no limit to what may be accomplished nor the important position it is likely to occupy when the war is over.

We are more or less familiar with the marvelous tales of what photography has accomplished in the way of intelligence through aëroplane cameras and telephoto work from balloons for this is the more spectacular part of the profession that has received the widest newspaper publicity. We would only add to the press reports the fact that, so far as apparatus is concerned, there have been revolutionary improvements made in both cameras and lenses for aëroplane photography, and the tendency has been toward simplifying the exposure of plates or films and making that part of the work more mechanical than formerly. Skilled photographers are not largely employed in the work of taking pictures from the air. The inventors and manufacturers have centered their effort toward making cameras that are either automatic or else extremely simple to operate. Some require the pressure of a lever to make a continuous string of exposures at proper intervals, and in the finishing these exposures are combined to make a panoramic view covering miles of trenches or roadways.

Others are built after the pattern of a gun, and are aimed and exposed by simply sighting as with a gun and pressing a trigger. It requires but a short training to enable the beginner in photography to master the use of such a camera, so it is turned over to the flying corps as a part of their work. The skill is required on the ground, where specially trained photographers are equipped with new instruments and conveniences for rapid development, fixing, printing and enlarging. The Aërial School, which was recently held in Rochester at the factory of the Eastman Kodak Company supplied the special training for the



FREDERICK CONVERSE BEACH, PH.B. DIED JUNE 8, 1918 (SEE NOTES AND NEWS)



corps of photographers who volunteered their services to the country. While those who attended that school are not permitted to tell about the new things that they have learned, they have expressed their open surprise at the wonder of the work they have been shown how to do, and intimate most positively that they have become acquainted with photographic processes that they had never dreamed of before.

We respect the desire of the Government to keep secret the contributions American photographic inventors and manufacturers, and do not feel that we are justified in even speculating on what these startling improvements are. But we feel safe in saving that when the war is over a body of young photographers will come home to their occupation with a lot of advanced ideas and an equipment of valuable experience that will give them a tremendous influence on the entire trade. The best brains and skill that the Government could enlist have been expended in teaching these photographers the highly specialized work necessary to apply their trade to the successful prosecution of the war, and they will hereafter be specialists in photography who will be free to use their experience for themselves and for the public. The stay-athomes must reckon on this competition and we feel sure that these young men will carry photography forward with tremendous strides.

It might be argued that these young men will excel only in commercial lines, and will not prove a factor in the portrait branch. Be not deceived. In fact, it will be the science of finishing, enlarging and paper and plate manipulation that will be highly specialized, and excellence in these departments will tell just as powerfully in portraiture as in commercial work. There has been much good work under the skylight ruined in the finishing and dark rooms, and, conversely, much poor work by the operator has been redeemed by the finisher. The public will appreciate the finishing quite as highly as the operating.

In enlarging, there are improvements that we hear of, but as yet have little actual knowledge. But we believe that

the war work will act as a decided boost to this most interesting and profitable branch of photography. The improvement in quality of enlargements during the past few years has been most marked. and yet the public is hardly acquainted with the wonderful possibilities of en-Papers and apparatus have larging. made possible today work that was hardly dreamed of ten years ago. venture to predict that the next two vears bid fair to accomplish more than the past ten years have, and these young men who are being taught the use of the very newest methods of enlarging will be in a position to feature this work in such a manner that the stay-at-homes will have to sit up and take notice.

The importance of good apparatus will be another valuable lesson that a large number of photographers will have learned. The war photographers will all be supplied with the very best of lenses, cameras and finishing accessories, and they will learn of the great advantage to a workman of modern tools of trade. Those who have been accustomed to worry along with crude and old-style instruments will never be satisfied to go back to them when they take their civilian routine work, for they will know from experience that they cannot do their best work with inferior instruments. Good apparatus is an incentive to higher aims, and many a capable man has been held down or has kept himself down by worrying along with antiquated equipment. There is not the slightest doubt but that, man for man, the one who is best equipped will be the most successful. just as in the broad field of manufacture the factory with the best and most efficient machinery will have the advantage over the old-fashioned factory with its uneconomical methods. cost of doing business is a growing problem that will be more acute with the coming years, so those men who are educated to modern apparatus and the latest improvements will be able to handle their business more profitably than the workmen of the old school.

Art is more or less fixed, and the ideals of the old masters are just as high today as they were thousands of years ago. But technic has advanced with improvements in tools and materials, and while we still admire the talent and ability of the old masters, we are bound to acknowledge that, whereas only a few could accomplish anything worthy under the conditions then existing, now there are many who, with much less ability, can equal and even surpass many of the things they did by reason of modern education and improvements. Much that is valuable now as historical would not find a sale in present-day commerce, and many pictures that command fabulous prices as works of art would not bring a farthing on the modern market.

Photography will receive an impulse from the war that will carry it forward many years ahead of its normal growth. There will, no doubt, be factors which are not now apparent that will exert as great, if not greater, influence than those we have mentioned. There may be discoveries that are at this moment unthought of, and we are prepared for almost any new development in photography that the mind can conceive. Necessity is the mother of invention, and photography is leaving the ranks of

luxuries and is fast entering the realm of necessities. There is talk of placing embargoes on luxuries, and, naturally, there arises the question of the extent to which such embargoes will effect our business. Arguing from past experience, we would be inclined to look for very stringent embargoes on photographic goods; but after considering the rapid strides photography has made toward the field of necessity in war and commerce, we are inclined to believe that the rules applying strictly to luxuries will have to leave photography very largely out of its scope.

Full of interest to us are the next few months, for we feel that they will prove a stage of transition that are full of promise. Our minds are in a receptive mood for the realization of any fanciful tale of the wonders of photography. We watch with the greatest interest every rumor, every report, every experience that comes from war use of photography, and we believe that the future holds much that is of vital importance to all of us. It will bear careful watching.—

Trade News.

GETTING MORE BUSINESS

I. THE FIRST ESSENTIAL

By J. CLYDE WILSON

TWO women stood on the sidewalk, deeply engrossed in conversation, and one of them was overheard to remark: "She'll never make a good housekeeper. She hasn't any sense of order. You hate to go into her house, it's so untidy." Most of us will understand the remark, because we have made similar statements ourselves, at one time or another, provoked by things we have seen.

The writer was talking with a gentleman, the other day, when mention was made of a mutual acquantance who had had a rather sorry time of it trying to make ends meet. "How's

 in grasp. He hasn't any system, and I'm afraid unless he takes a decided brace he'll soon be overwhelmed and

beaten in the struggle.

This is one of the saddest spectacles in the world, and yet it is not an uncommon one. There is no one so humble he does not feel fully competent to pass an opinion of his fellows based upon his experience and observation. As the saving, is we can all see the other fellow's faults when we cannot see our own.

Where this concerns the business man, and the photographer in particular. is in the fact that we are governed largely by these snap judgments. They give birth to prejudices, and, in spite of all we can do to be governed by reason, most of us act according to

our prejudices or preferences.

Perhaps this is more marked in the case of the photographer than it is with some other lines of business, because the photographer deals largely with women, and women react to unfavorable influences of this nature more quicly than men. It is no reflection to say that they sense disagreeable and unfortunate conditions instinctively and act accordingly without any pretense at reasoning. A smell of cooking victuals, though it may not be a bad smell, will prejudice some of them against a studio forever more, for they realize its incongruity in connection with a place of business and it disgusts them at once. Women are fond of children, as a rule; but when they come to a studio all togged out in their best they will resent finding the owner's dirty-faced urchins running around the place wild-even though they may jog them on their knees and fondle them with a mother's instinct. Why? Because they have come to the studio for an experience that is uncommon. They have dressed for an occasion and they want the atmosphere to suit. They want to get away from every-day things for the time and to surround themselves with the elegances that go with Sunday clothes. It is shortsightedness to overlook this fact.

The appearance of the studio and surrounding premises is far more important than most of us realize. Our leading photographers know it and leave no stone unturned to deck out their places, as you might say, in a style in keeping with the environment to which their particular clientéle is used. They locate their studios, moreover—the most up-to-date ones—in the fashionable neighborhoods where their patrons reside, because they want them to feel that they are one of them—their own kind. This goes a long way toward breaking down the barrier of dread of going to strange places and placing ourselves in the hands of strange individuals to have our pictures taken. So, if your studio is down-town, the best you can do is to arrange it in the taste and manner of that class of patron you are prepared to serve. You cannot show by the outside, except in so far as you can be in a modern building, the char-

acter of your place.

It is an erroneous idea to think that to reach this ideal demands an expenditure beyond your means. Good taste is not limited to those of means, and some of our most exclusive shops in the large cities, which may be taken as fair examples of what is desirable, are housed in old abandoned residences and suffer not one iota from the fact. But they do not have an abandoned appearance. The age of the building may but add dignity to the setting and give it the air of inbred gentility, if you will sanction the phrase. That is to say, culture is usually a growth, and these aged structures if tastefully furnished have the appearance of being used to the touch of a fine hand; they invite confidence and have an air of permanent well-being.

One unfortunate fact about human nature is that familiarity breeds a kind of insensibility. We get so used to our surroundings that, sometimes, they run down by a gradual process so imperceptible to us, who live with them constantly, that we are entirely oblivious of the fact. You may notice in passing that your competitor Jones's showcase needs a coat of paint badly, and pass in and out of your own doorway a hundred times and never observe a similar need in your own case. If you went into Jones's studio your eyes

would be wide open and you would see a dozen incongruities at once-you would be looking for them. But Jones could find many legitimate faults in your layout that you probably had never noticed, and you would have to admit were faults if you were honest. The great danger here is that things will get so far beyond repair before we notice them that the task of refurnishing the place seems well-nigh hopeless, and we leave well enough alone and let conditions go from bad to worse. If it is true that the environment marks the man, it is also true that in time it possesses him. If we are not masters of our environment it masters us. If you cultivate the habit of neglecting necessary repairs, in due course you find neglectfulness becomes such a habit it is well nigh impossible to disentangle yourself from it. You say, easily: "Oh! What's the use?" and let things go at that. It is at just about this stage that the young fellow opens a studio up the street and steals your business away in a night by such a sudden and simple coup you are left utterly flabbergasted. He simply makes his place up-to-date, so attractive and inviting, so clean and fresh, and evidences so keen an enthusiasm for his task that his patrons enthuse in turn and talk about him to everybody, and call you an old fossil who has had his day. Neglect is one of the earmarks of approaching senility.

It pays to look prosperous. You recall the recent farce-comedy in which the hero, an impecunious youth, aspired to sudden wealth. But without means to accomplish his purpose, his ambition seemed a rather vain one and the course of hard drudgery seemed the only one open to him. Finally, in desperation, he filled his pockets with stage money and sallied forth into the highways and byways to woo the elusive goddess of fortune. He looked the part of prosperity even though the jingle of real coin was something he could not enjoy. Nothing daunted, he marched right into the midst of the rich and flourished his stage coin with all the indifference of a sudden-rich miner. Fortunately greenbacks all look alike at a comfortable distance, so long as you don't have to use them in payment. The wealthy, with childish gullibility, opened their mouths in awe and crowded about the ambitious newcomer. No one could do too much for him. He was invited here and invited there and entertained with lavish hand. Investments were sought for him and loans extended, and lo! the young man woke up one morning to find himself rich, all on the earnings made by the loans of his well-to-do entertainers. We wouldn't recommend this as a safe experiment, but it is an interesting and amusing exaggeration of the fact that the appearance of prosperity begots prosperity

perity begets prosperity. So we say that the first essential in a campaign for more business is a due regard for the appearance of your premises. It pays to court the good opinion of the public. Look over your studio today; size it up from front to back, from top to bottom, with a cold and unfeeling eye. Ask yourself if there is one single detail about it that merits reasonable criticism. Of course, you cannot please everybody, and it is no use to try, but you can get rid of those things which offend ordinary good taste and common sense. Start with the showcase on the street, and don't leave the matter drop until you have planned some improvement to it. Surely there is some detail that can be changed to advantage. Are the seams all puttied up? Is it painted neatly and lettered with care? Does it need new hangings? Are some of the pictures held in place with carpet tacks when twenty cents worth of glassheaded pins would look twice as good? Are there too many pictures displayed? Are they representative of your best work or just plain three-dollar stuff? The showcase, remember first of all, sells the idea of your capability. People want to know the kind of a photographer you are more than they do your prices; therefore, your showcase should be trimmed not so much to sell individual styles as to sell the idea that you can make pictures folks will like. Display your very best and change the display frequently.

If you are located upstairs, pause at the entrance and look up. If you were a stranger would you want to go up? Are the stairs well painted or varnished, and clean. Or do you use one of those common stairs that serve several people and no one thinks it his business to keep clean? If it is the latter, forget your attitude today, and henceforth keep that stairs clean if you have to do it yourself—no place tells like the entrance. This is where the initial impression of you and your business is formed. Disarm criticism by keeping it clean and presentable.

Let us walk up the stairs and pause in the hallway to look around. Do you use the hallway to store packing boxes and discarded furniture, or is it, too, clean and inviting? These are little

details that tell in big ways.

We are now at the reception-room door; we turn the knob and enter. What is the first impression? We look around. If it is a strange place that is the first thing customers do. Is the place cheerful, light and airy; the walls papered in a warm light tint of plain paper, with here and there a picture artistically framed—or is the place gloomy, the paper gaudy with a fantastic pattern, and almost hidden by a gathering of pictures that have been accumulating for twenty years? Most reception-rooms are failures and for just the reason cited. What happens when you enter? Does the receptionist —if you have one—rise and greet you with a pleasant and hearty smile, or does she keep on reading her magazine and wait for you to speak or at least attract her attention? A good receptionist is a jewel, but they are altogether rare. She needs to be attentive without being in any way obtrusive or even aggressive. The patron must seem to guide the conversation, while in fact the receptionist is furnishing leads—as we say sometimes—is keeping the interest unflagging and working toward a definite preference. It is pretty hard to say just how a receptionist can best do this—it depends so much upon the individual. A little touch of human sympathy is desirable, with the ability

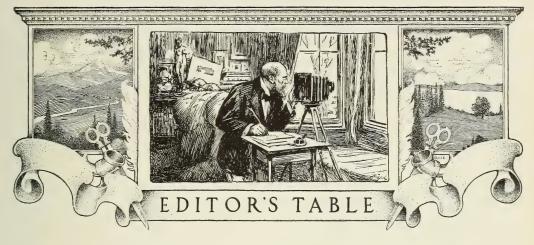
to add little pleasant sidelights in conversation; on the other hand, familiarity breeds contempt. There is a nice opportunity for discretion here that it is hardly possible to define in words.

Turning now to the operating room: Is it also clean and inviting? What a welcome place it can be made! It is light, in the first place, which suggests cheer and is all in its favor. If the appurtenances are piled away out of sight, or at least in good order, it helps a lot. And your furniture here: Is it modern and up to date? Who wants to be photographed in grandfather's chair or on a haircloth stool? These are relics of bygone times and have no place in a modern studio. Care should be taken to see that your rugs are not worn too badly and frayed at the edges. Nothing looks so slipshod as this. Rugs last a long time, and their cost can accordingly be spread over a long period, so they really cost little, all things considered. Keep them looking well.

And last but not least, drop into the dressing room. Is it clean and free from the belongings of the last patron? And you, yourself: Looking into the mirror, do you find a well-dressed, tidy-looking business man there, with clean collar, hair cut short, clothes brushed and well pressed; or do you dress for the dark room and save your good clothes for lodge night? The ladies are your patrons, and they notice this especially, and it all goes into the mind as an impression that is spread abroad in telling others of the visit to your studio.

Make your premises and everything about them attractive. To attract, says the dictionary, is "to cause to approach; to draw," and the capital example is a magnet. Is your place so attractive it is a magnet for trade? Prejudices are built upon first appearances. See that your public is prejudiced in your favor and not against you. Then you are ready to cultivate that patronage and to devise plans for getting MORE BUSINESS.

(To be continued)



WASTE

HE question of waste is a very serious one in too many studios. A photographer in the past could clothe himself and buy cigars from the sale of residues. That was an example of clear saving. Every cent that a man received for silver or gold, recovered from his waste, was a cent which he had already paid to the plate man or the paper man. It was only made money in so far as it was *saved* money. We see much in some photographic papers about the recovery of wastes, even though wastes are almost a thing of the past with many photographers; but we see little of the waste in plates or paper, which is a tenfold more serious matter than the wastes in the residue tanks.

It is a fact that a photographer's business is one of the few in which there is not a close check kept on all income and expenditure. The average storekeeper—a mere middleman—buys stock, and he sells that same stock. He knows the buying price and the selling price of things he handles, and he knows what the difference between these prices must be to pay expenses and to leave a You may even hear the grocer say that paper and string cost money this is when you are buying sugar these Too often the photographer is not a business man in the usual sense of Railway millionaires send their sons to drive engines or brake freights, and wealthy storekeepers place

their sons behind the counters. photographer too seldom serves this healthy apprenticeship. It is easy, and not at all advisable, to be parsimonious; but it is easier, and almost equally inadvisable, to be extravagant. It is so very easy to expose a dozen plates on an interesting sitter when half the number would be ample. With a dozen exposures the photographer picks out the best; with half the number, greater care in posing, etc., would bring the best. And every time that care is used it tends to elevate the photographer's standard of work. We are aware that some photographers—some of the very best—do not agree with us on this point, and say that the waste is inevitable. It may well be that in their business it pays to submit a generous number of proofs, but in many poorer businesses the use of plates is careless rather than inevitable. number of prints, too, which go into the waste-barrel is often abnormally large. Help, either careless or inefficient, is accountable for much loss.

The average photographer does not buy well or wisely. This used to be a more glaring fault than it is today. In these war times, when economy is the keynote from the Government to the individual, it pays to buy always the best.

We have not elaborated on these points, though the records of some studios would authorize strong writing. We have known studios closed up by sheer waste of material, and we have known them lumbered up by accumulation of ever-useless material. It is not easy for a man to change his methods, least of all when those methods are the result of lack of business training. But if the man will do so, he will find (and he is numerous) that he has within his reach the means of very considerably improving his year's balance, and these are the times to do some wise thinking.

PERMANENCY

PHOTOGRAPHER, like other business men, is sometimes rather inclined to depend too much upon past achievement and to lose sight of correct proportions as between an effort and its results. There are many things created for temporary use—and not the least of their advantages is that when they have fulfilled their purpose they may quietly be consigned to the dust-bin. A man or body of men desire a certain end, and they devote a certain amount of effort to its attainment. When the thing is over the account is closed—like a holiday—and remains only a memory.

The moral is that a man must be constantly doing things if he wishes to succeed. Some men occasionally produce a strong piece of work, and think that such should make them "artist photographers" for all time. Such men are not uncommon; men whose common run of work is very weak, but who can always manage during the year to squeeze out a few "masterpieces" for the conventions.

Too often some special effort is calculated as though it were some ball which, once set rolling, would keep going through all time—a sort of perpetual motion, in spite of friction. It would be nearer the truth to compare it with a The fire blaxes up, and we are warmed; the fire goes out, and there is an end of it. Continued success can only be obtained at the price of continued achievement.

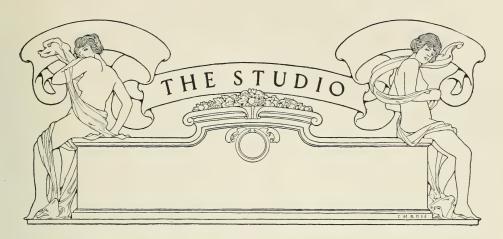
It is the old, old question of settling into a rut. As a pure matter of business a certain amount of rut is a very good thing. It is possible to have too much enterprise in business, as many photographers must feel as they buy their mounts in dozens or fifties, because a new pattern is floated every week. It was so very much more convenient the old way, when cabinets could be ordered by the thousand; but for good or ill, conditions have changed, and we must keep pace with them.

Have you ever noticed that many men change their styles; the most conservative of men, too, change so gradually that it is scarcely noticeable—in fact, the change is a matter of years. look at their work now as compared with ten years ago, and you will see the difference. With added practice and the gradual accumulation of ideas or wrinkles their work gradually grows.

Such is the best change for the man at the top. Even he, if he believes in permanency, believes that he has reached the finality and perfection of things, will gradually slip backward. But the smaller man, the one who finds business small in quantity, and doubtless competition keen, cannot afford to undergo such a gradual process of evolution. He must out and hustle. It is this live hustling, this keeping up-to-date, keeping out of that permanency which is but another name for a rut, that is responsible for much success. And it has more advantages than one often realizes. We are prone to think of hustling as a necessary evil, usually forced on us when a new man comes to town with his coupons, and schemes, and cut prices. His plan is to get all there is in it, and to that end he creates all the new trade he can, and also gets all of your trade that he can. And there is no doubt that he hurts. But the two of you get more trade out of the town than you alone did. The trouble is that two of you have to share it, and so it pans out slimmer than when you alone were working, say, three-fifths of the possibilities of the town. But the point that is overlooked is that the new may came to the town because he saw that extra two-fifths possible. Had you been as live before he came as you were afterward he would never have come.

Let the day's work count; don't depend on what has gone before, and the chances of success will be much greater than if too much trust is placed in

permanency.



PRACTICAL PAPERS ON STUDIO WORK AND METHODS

Studio Advertising.—The Follow-up System

The question of following up advertisements is an exceedingly interesting one in any business. There are many different ways of doing it; but that it should be done one way or another is a generally conceded fact among those who yearly spend large sums of money in the production of booklets, folders and special announcements of all kinds, as well as in the use of the daily, weekly and monthly publications of the country. There are, however, those who do not yet appreciate its value; and the writer is cognizant of one concern which annually spends large amounts of money in advertising of various kinds, until, in fact, they have estimated the approximate cost to themselves for each inquiry that they receive at a figure of \$2.75; and yet with this tremendous cost per inquiry they do not follow up their advertising at all. Their catalogues and announcements are sent out broadcast, and no record kept of those to whom they are sent, excepting the original letter of inquiry, which is filed for one year, and at the end of that time destroyed. It seems hardly conceivable that in the present age of systematic advertising any business house can be so blind to their own business as thus deliberately to ignore the opportunity for turning a vast number of these inquiries into definite orders for goods. The same result obtains in any business where publicity costs money, and unless the advertising is followed up with some definite system, there is a vast amount of money wasted which might otherwise be converted into profitable orders.

It will be seen that the writer's business creed embraces the thought that advertising is intended to stimulate interest in the goods advertised, and that if an inquiry can be elicited from the reader of the advertisement, the prime object of the advertisement has been attained, and its full value has been consummated. From that point on it lies with the office or business manager to do "the rest;" and with a proper follow-up system, "the rest" should be comparatively simple. In the specific case of a

photographic gallery or studio a follow-up system of the simplest kind is the one which is to be recommended, and is the one which can be found and carried out with little difficulty. first step in the installation of such a system must naturally be the selection of a list of names embracing all those people of a given community whom the photographer desires at some time or another to have upon his books. This list should be prepared with the greatest care and completeness. Every possible source of information should be used in its compilation. In the cities and the larger towns blue books and society registers are almost always to be found from which such a list may readily be started. Telephone directories add another source from which many names may be drawn, and the local papers should be carefully scrutinized with every issue for society events, notices of marriages and births, and all sorts of local happenings in which the names of people are recorded. Each name, with full address, should be entered on a card specially prepared for the purpose, and these cards filed in alphabetical order in properly constructed drawers or cabinets fitted to receive them. An outfit of this kind is not expensive and should form one of the most important items of the stock in trade of a successful studio, next only in importance to the negatives which form the basis of its working capital. Such a card index as this once started will be found to grow very rapidly, and the photographer in whose studio it is installed will probably find himself in the habit of carrying a pad or blank book in his pocket on all occasions. In this book, or on this pad, he will enter from time to time the name and address of those with whom he comes in contact outside the studio or which come to him in the course of correspondence or in other ways; and every day or two the list should be checked off and such new names added as are not already there. Each card in such an index should contain ruled spaces not only for the name and address of the party whom it represents, but should also be ruled up and down and across with blanks on

which from time to time may be written the date and a symbol referring to some special form of advertising that is sent to the addresses at that time. On the same card there should be also blanks in which may be recorded any reply, inquiry or personal call resulting from this special advertising form, together with the date and any remarks pertinent to it. As each announcement is mailed to the list of customers included in the card index, the date and symbol should be entered, and a careful examination should be made at the expiration of, say, two or three weeks, with the purpose of finding out how many responses, if any, have been received. If replies have not been in sufficient number to satisfy the expectation of the advertiser, he should at once prepare a second letter or announcement of some kind bearing upon the first, and send it to the same list, entering upon the card a record of its sending, and noting each return therefrom as it is received. In such a way as this he may keep in personal touch with the results from every piece of advertising matter that leaves his studio. He may analyze the returns that come in, and a careful study will do much to put him on the track of a more profitable method of announcement for another time. It will frequently be found that returns from any one given announcement are very unsatisfactory, while another, less elaborate, less expensive, and from which he anticipated little return, may have been extremely profit-This will give him a line on his work, and will suggest many ideas in his future policy of advertising that would be wholly impossible without some such system of tabulation and comparison. Let this said index card be kept entirely for the tabulation of publicity and responses, and do not attempt to mix with it any record of the orders received or the details of the studio work. Keep all such records, including the name of customer, date of order, size and number of prints, numbers of negatives, etc., on another set of cards properly ruled; and in such a way separate the advertising from the business end of the studio, remembering that the inquiry of the customer or his call in response to your invitation marks the end and finish of the advertising campaign. Do not let the amount of his order, be it large or small, get mixed up with the fact that he has responded This is the in some way to the advertisement. purpose of the publicity, and when the response has been made its end has been accomplished. From time to time go over the index and make notes from it of any callers or other responses to the publicity of the studio. Compare them with the actual orders entered upon the cards in the list of customers. Note carefully all who have inquired or otherwise expressed interest, whose names are not included in the list of actual customers, and make a special effort to find out why their interest has expired without being productive of definite order for work. Look then to the salesman, and if the returns from the inquiry are not satisfactory, do not lay it to the advertising policy.

To sum up the whole matter, then, the value and advantage attaching to the use of a followup system lies in the fact that in each specific

case where a written or printed announcement or circular of any kind is sent to a person it is easily traceable, and if not productive it may be followed up by a second, third, or even fourth announcement at any time, and that all these records are easily get-at-able and available for use at a moment's notice.

Let us see how such a plan would work in actual experience. The photographer who has installed such a system in his studio comes in on a rainy morning, and after attending to the necessary details of the studio, he betakes himself to look over the list of those whom he desires to have on his books. Turning over the cards one by one, he obtains a comprehensive view of every effort that has been made to interest these people in his work. The mere fact of running over the cards brings to his mind incidents and local happenings. These will prompt him on the spot to write or dictate a personal letter to this or that person, who, already familiar with the circular letter he has put out, perhaps only needs this one touch of individual interest to clinch the good impression that may have been forming, and that may even then be ripening in their mind. He cannot obtain such a view of the prospective field in any other way. It would be nonsense for him to attempt to cull from the blue book or directory these names each time, nor could he find them on his ledger, for the simple reason that they are not yet customers. He has laid out before him a comprehensive list of all the people whom he wishes to reach, and only those. He sees at a glance whatever result has followed his previous effort, and may apply the remedy in local cases where the responses have not been made apparent.

Another great advantage of the system is that it is not confined to the large studio. A carefully selected list of only a few hundred names, followed up from time to time in this way, will be productive of much greater good than the indiscriminate circularization of the whole community on spasmodic occasions without any means by which track may be kept of what has been done. I, therefore, firmly believe that the value of all publicity is dependent more upon its intelligent following up than upon the money spent in preparing and distributing it.

Individuality in Style

ONE of the greatest dangers from the artistic point of view which the professional photographer has to face is that of losing any characteristic style he may possess, through the advent of new and easy printing processes. Bromide and gaslight papers have been a boon to the busy portraitist during the last two years, when sitters have been numerous and skilled printers have been scarce, and from the financial stand-point, not looking too far ahead, they have been in, in the vernacular, "good business." But we should be sorry to feel that developing papers were going to reduce all photographic displays to a monotonous level, no matter how high that level may be.

Therefore, we counsel all photographers, when the period of pressure is over and things are settling down into something like normal conditions, to remember the processes which they used to work, and to try to attract patronage by showing something different from that to be seen a few doors further along. We have been one of the most imitative classes of workers that the world has ever seen. In daguerreotype and collodion days the cases and mountings of one studio were precisely the same as those of the next in the same grade, and as the price got lower the finish got poorer; gilding got thinner, and finally gave way to lacquered metal; morocco sank to sheepskin, and finally to paper, but always in the same style. Why? Because the easiest way was to send to the dealer for what he chose to consider the correct thing for the purpose, and if the customer did not grumble, why should anyone else do so?

We see this again and again in later periods. We had the carte period, the cabinet period, all G. B. E. mounts, and later we have had epidemics of Rembrandts and sketch-portraits.

Even now, when it is the fashion to stick a picture on a piece of rough paper (a very good fashion, too), photographers nearly all rush to buy the same sort of paper, in the same sizes, as is used by all their brethren.

There is now a real danger of the beautiful and permanent prints, which can only be obtained from platinum and carbon, and the delicate tones of printing-out processes, being entirely swamped by the fatal facility with which toned bromides can be turned out. Good as these are, they must not be considered as saying the last word in photography to the exclusion of all others.

To suggest style and methods of either printing or mounting would defeat the object we have in view; but it may not be amiss to touch on the leading characteristics of the various printing processes. Thus, ordinary P. O. P. gives tones from sepia to purple black and matt or glossy surfaces. Excellent matt surfaces may be obtained by squeegeeing glossy prints upon ground glass. Self-toning papers are usually collodion surface; they give tones from sepia to blue-gray, and the matt varieties have a very pleasing surface. Drawing-paper, salted and sensitized, gives very artistic results, and is printed and toned as P. O. P. It is specially suited for large work. Carbon affords an enormous variety of colors and tints-terra-cotta, green, blue, mauve, etc., as well as the recognized sepias, purples, and blacks. Matt or glazed surfaces, on a varied range of papers, are easily obtained. Platinotype yields black and sepia prints on a pure paper surface, without any gelatin. The semi-glazed variety is known as Japine. Gum-bichromate is a variety of carbon or pigment printing, the texture is usually rather coarse, but it is well adapted for large work. A large range of colors in Indian ink, sepia, and red-chalk tones are available in this medium. Bromide and gaslight papers give black tones of varying tint. Most makes may be toned to a sepia, while some give good purple P. O. P. effects with hot hypo and alum. It is possible to obtain various blue and green as well as red tones, but the results are rather uncertain, and some colors are not permanent.

In practically all these processes a large variety of surfaces are available, starting from glossy

and ranging through semi-matt to rough and extra-rough surfaces. Most papers may be had in white and cream tones. One brand of selftoning paper is issued on various blue, gray, and green bases, as is also one brand of bromide paper. There is also "Transferotype," a bromide paper which permits of the image being transferred to wood, card, glass, or opal. It may be toned sepia or left black. Here, then, is a variety ready for the man who wants to create a new style, and has the taste and energy to carry it through.—British Journal of Photography.

Advertising a Photographic Studio¹

Newspapers and Other Publications

Newspaper advertising in a small town pays the local photographer if it is the right kind of advertising, and it is done in the right way, and if it is not too expensive. Don't take more space that you can afford. Don't advertise recklessly; think out your scheme and then clinch it. When you have fixed for your space, then write your advertisement according to your space; remember that space is as valuable as matter. Don't indulge in too much padding. Say what you have to say in a bright, cheerful and business-like way, and make the advertisement tell its own tale. Don't just merely make an announcement, but say something to the point. Appeal to the class of people that you want to reach.

When you see a man with a pleased smile reading his prettily worded advertisement you know that man is about to lose money.

Make your lay-out good; write your advertisements to sell, not to amuse yourself.

The way in which an advertisement is prepared reflects the skill, or want of skill, of the advertiser. You must have strong selling talk in your

advertisements; the pretty drivel of the idealist is no good for pull advertising.

The amount you should spend in advertising may be anything from 2.5 per cent. to 5 per cent. of your turnover.

If a man in a small way of business cannot write his own advertisements it is because he is not observant enough or imaginative enough and is inflexible. How can such a man succeed in a business? He will surely fail whether anybody else writes his advertisements or not.

Read all kinds of advertisements to get your ideas from them. Make a note of any good

thought that occurs to you.

In writing an advertisement you want to get yourself into direct contact with the reader. You want to introduce, through your advertising, a mental suggestion, or a counter suggestion, and make the personal touch so intense as to pull business in your direction.

Don't exaggerate in your advertisements. For instance, don't say, "I make the best photographs in the world," or "Mine are the lowest prices in the country," or that you have all the latest inventions and infer that your opponents have none. You are wasting valuable space,

A paper read before the Professional Photographers' Association of Australia by Mark Blow.

your reader won't believe you, and your adver-

tisement will do no good.

Advertising is only a means to get people into your studio; it is not a means to satisfy them—you must do that.

Posters, Signs, etc.

In poster advertising we have to contend with two hostile forces. There is that over-strung, over-sensitive, superesthetic individual who, if you met in an art gallery or exhibition, would be constantly buttonholing you to come and hear his opinion on all and sundry. He would point out to you all the good points and all the bad points, according to his idea, and risk the hope of his correctness in each case. This individual is constantly writing to the Press screeching against poster advertising.

Then there is the Press itself. The first thinks

Then there is the Press itself. The first thinks that his artistic sense is injured, and the other knows that its business is injured by the com-

petition of the boarding.

Some say that poster advertising violates the public mind. They say that the eye should be free from this kind of assault, and that many sensitive persons suffer from the nuisance. I admit that our harbor and other scenic surroundings should be protected from spectacular advertisements, no matter how beautifully got up. I also admit that bills indiscriminately posted on roadsides, walls, palings, trees, telegraphic and other posts are a public nuisance.

In posters, signs and such like advertisements it must be admitted that if a name or a picture or a contrivance once gets fixed in the memory it is safe to say that it will be recalled when the subject is under consideration, and as the constant dripping of the water wears away the stone so the constant sight of the same word or sign

sinks deeper and deeper into the mind.

Coupons, Invitations and other Schemes

When a shabbily-dressed man calls at a house with a smelly breath and smelly clothes, and a shabby sample case and a carelessly rolled-up book of coupons, and offers to sell one for 1s., and tells a tale about his little wife and big family, and how long he was in the hospital, and tells of the hard heart of his landlord and the lack of sympathy of the charity societies, he may sell a coupon; the buyer takes one to get rid of the man, but—and this is a very big but—what is the effect on your studio in the eyes of the public? I would not say, don't have convassers, but I do say it is playing with a very dangerous weapon.

Invitations. To work the invitation scheme

Invitations. To work the invitation scheme successfully it must be done on a lavish scale, and prices must be high. There must always be a reasonable excuse for inviting a prospective sitter; then, if he is one who can afford to pay, the operator must pay a lot of attention and be simply charmed with the sitter as an art model, and would just like to take an extra large negative for his own satisfaction. Then when the proofs are called for the receptionist has to take up the cudgels and make good. When you invite children you must always make a fuss over them, and let the mother think you are really most interested in them, and that you rarely get such interesting kiddies in your studio.

Invitations have been the stepping-stones of success to many of the larger studios of the present day, but these very studios now look down upon the invitation system as degrading to the profession. Why photographic journals have so much to say against invitations is a thing that passes my comprehension.

Advertising schemes, such as a baby competition or a beauty competition, are very questionable means of advertising for a small town. You are sure to displease those who are not successful. It is never their face that is at fault, it is always

the photographer.

There can be no doubt that advertising in general is one of the most elastic of all commercial undertakings; by it many have made fortunes and by it many have lost fortunes. Bad advertising is sure to lose money, while good advertising should certainly stimulate business. The copyist in advertising is almost certain to go down; to be successful an advertisement must be original. It is only the original advertisement that strikes home. There is a telepathy in advertising that cannot be explained, but it is as sure as the turn of the tide.

Gentlemen, I have given you of my best after much thought, much research, and much compiling. There are many nuts in this paper; it is for you to find the kernels. This I am certain of, that any young man starting a photographer's business who follows the advice given in this paper, provided he has average business capacity, other things being equal, must succeed.

The Girl Printer

The chief essential to the success of the girl printer from every point of view is to bring thought to her work, and to do it with her head as well as with her hands. Speed and correctness in working are only gained by making persistent efforts and carefully studying the prints you have made.

To work by rote is not sufficient; carefully read and consider the articles that appear in magazines and you will pick up many a wrinkle that will be of good service, for it is usually in the little simple things that troubles occur, often

through carelessness.

The production of good sepia-toned prints is almost an art in itself, and is now acknowledged to depend chiefly upon the quality of the black and white print as well as upon the negative. There are, however, different brands of paper which will be found to yield certain tones with more ease and certainty, and these, of course, should be kept to.

With developers, again, the girl printer should make herself familiar, as these are many and varied, and each of them have their different qualities, and some papers will respond much

more readily to one than to another.

If the girl printer will but think over her work she may save much needless work and waste of time, and so make her work lighter. For instance, in cold weather she will change prints from dish to dish to wash them, and will add enough warm water to the washing water to keep it at a proper temperature, which is better both for the prints and for herself, and she will

do the same in mixing up baths and developers, so that she may avoid chilblains and chapped hands, which often, when working with chemical

baths, lead to blood-poisoning.

It is only to be expected that in changing berths some fresh difficulties will be encountered, for each photographer has his own pet methods, which she will, for a time at least, have to conform to, while in some districts excessive softness or hardness of the water supply will cause trouble, particularly in toning during warm weather.

With regard to such work as pencil point, or blocked-out prints, photographers work in quite different ways. Some mask with black paper, some dab on thick paint, and some properly block out either by hand or aërograph on the film of the negative, but in changing about you will have to make yourself at home with each

method probably.

Enlarging comes within the scope of the printer's work, and this is a branch where great skill is called for in dodging, faking, and improving in order to make tip-top enlargements; also good judgment as to the best surface of papers to

use.

I think it would usually be a help to most girl printers if they were now and then allowed to try a little operating, in order that they might see just the right gradation of light to reproduce in prints, as with such lightings as line, firelight, and "Rembrandt" it is often rather difficult to know when the perfect result is being obtained, and there is nothing so helpful as actually to see a sitter under these different conditions of light. It is also worth while to examine carefully some of the tones, etc., of travellers' sample prints to see just what can be got out of any given paper.

As to your actual working methods, you must look out for yourself; other people will be too busy to think for you. Provide yourself with a seat, so that if you wish you can sit at all your operations, for one of the banes of a printer's existence is excessive standing in nearly one position, often with a bent back. If the sink is too low, prop up your dishes; but whatever you do try and make your work as healthy as you can by letting in fresh air. Let perfect cleanliness be the first law of your dark-room.

Platinum printing is now mostly done by electric light, and so also is a lot of carbon printing, but in both these processes great nicety of judgment and handling are called for, with a careful study of the makers' text-books; but if you get into real difficulties the makers are always ready to help, and many of their travellers are excellent demonstrators too; and a little help is worth a lot of pity.

help is worth a lot of pity.
P. O. P. is a fairly easy process, and calls for little save exactness and cleanliness and not too

rough handling.

I think a girl printer is well advised to get a good idea of the various sources of chemical supply and how things are sold, as there are many little economies to be effected in ordering properly. Sometimes ordering from a nearer depot will save a shilling or two on carriage, and so on.

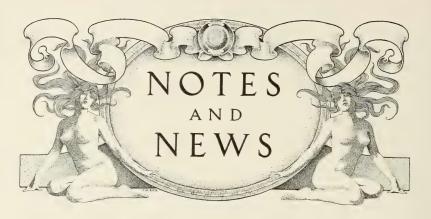
Just one last point I would like to mention. Some printers almost grovel in the deep semi-darkness of the dark-room, straining their sight and bringing on bad headaches, and all for want of more light. This, too, is quite unnecessary, for paper will bear plenty of light provided it is safe, and there is no real need for this discomfort. Deep yellow or light red fabric is quite safe, and the extra light will be much better for you, and enable you to work faster.

Finally, if you employ a girl printer and are not satisfied with the work she gets through, or if you are a printer and don't like it and feel grumpy, in either case, just put your thinking cap on and see what you can do to remedy this state of things, for discontent is the nastiest microbe in the world. You will soon find out that, if you try, you can much improve matters, for an unhappy worker is usually a poor worker.

—G. E. H. G., in *British Journal of Photography*.

The Appearance of Coolness

Producing effects by suggestion is a point not to be forgotten. Thus the "nut" driving a motor-car thinks he is going faster if his car makes a terrific noise. The police also seem to have the idea that noise connotes speed. So in cooling the studio and premises generally there are many little illusions which will make the place look cool. Plush furniture, thick warm-colored rugs, and so on, should be removed, and the cleanliness of linoleum-covered floors will make for a cool appearance; in fact, anything of a frowsy nature should be removed. A few freshly cut flowers brighten the place and look dainty, and these need not be expensive varieties. What could give a better or fresher effect than a few sweet peas, for example. Where possible a recess filled with some ferns in pots will give a cool green note, and if to this could be added a fine fountain spray so much the better. Such a spray could be made quite readily with a few feet of small compo piping, the jet hole being no larger than a pinhole, and the water supply a 2- or 3-gallon stoneware jar set out of sight, the water siphoning out of it to supply the tiny spray. The use of ice is worth considering, for ice is now reasonably cheap, and a glass bowl with a piece of ice floating in it would look cool, and would also lower the temperature. It might not last long, but is one of the little devices which might be used occasionally for special sittings. Perhaps the most important factor of all is the one already hinted at, the perfect cleanliness of the place, an appearance of freshness, a feeling of sweetness of air and so on, which is unfortunately often lacking in the photographic establishments we sometimes have occasion to visit.—British Journal of Photography.



National War Work Council of the Young Men's Christian Association of the United States Wants Slides

The Y. M. C. A. is called upon to furnish immediately an enormous number of stereopticon slides for the entertainment of our soldiers in France. The work of entertaining the men over there has fallen very largely upon the stereopticon because of certain difficulties encountered in operating the movie machine and because the stereopticon is the only form of entertainment which can be put into use in many of the small outlying sections where thousands of our men are billeted.

Many of the Camera Clubs and their members have many slides which may be ideal at the moment and which the clubs or their members would be quite willing to send over to France and put into use where they could serve a most timely

and useful purpose.

Almost any slides, plain or colored, on any subject, with or without reading matter, can be used. The slides should of course have titles or something to describe them and they need be packed only so that they could reach the office safely. They should be addressed: J. A. Rawson, Jr., 347 Madison Avenue, New York City.

"Photograms of the Year 1917-1918"

This year's volume appears somewhat later than usual, owing to difficulties in its production, but it will be none the less welcome; in fact, it is surprising and gratifying to note the high quality and interest of this collection considering the usual difficulties attending the publication under the closely restricted conditions prevailing in England at present. In the editorial article Mr. Mortimer deals with "The Year's Work," and gives a resumé of progress with the camera during the preceding twelve months. Mr. W. R. Bland's article, "Observations on Some Pictures of the Year," deals critically with the reproductions, which number upward of a hundred. Mr. Ward Muir contributes an informative article on "Photography's Part in the War," and Mr. Antony Guest writes about "Pictorial Photography after the War."

The feature of *Photograms*, of course, is its collection of well-printed reproductions of the best

pictures of the year, in which the United States is liberally represented by 26 contributors out of 86 in all; and this shows no falling off in either quantity or quality. It is a book that everyone interested in pictorial photography should secure without delay. The price in paper covers is \$1.50 and can be supplied through the American agents, Tennant & Ward, 103 Park Avenue, New York City.

Flag Raising at Bausch & Lomb Optical Co.'s Plant

"The most inspiring sight I have ever seen," was the statement of City Assessor Charles E. Ogden, as, amid a burst of spontaneous cheering from five thousand throats, Old Glory was slowly hoisted to the top of a new sixty-foot steel flagpole in the rear of the new St. Paul Street factory of the Bausch & Lomb Optical Company, shortly after noon yesterday. Mr. Ogden was the speaker of the occasion.

The exercises were attended by over five thousand employes, company officials, army and navy officers and others connected with the company. The programme began at 12.30 o'clock with a concert by the Bausch & Lomb band under the direction of Theodore Dosenbach.

The bugle-call assembled employes around the staff. Two army lieutenants stationed at the plant hoisted the flag. William A. E. Drescher led the salute to the flag and the pledge of allegiance. The gathering was then led in reciting "The American's Creed" by Edward Bausch. An interesting feature of the programme was the reading by Mr. Ogden of a letter from Brigadier General C. C. Williams, acting chief of ordnance, United States Army, expressing appreciation on behalf of the Ordnance department for the work being done at the Bausch & Lomb plant.

"The greatness of our country is the greatness of all of its people," declared Mr. Ogden, delivering the address. "The flag stands for the greatest gift of God in the form of the best governent which has been given to any people on this earth. America is being anxiously watched by all the peoples of the world to see how the experiment of government by the people will work out.

"Our sentiment for the flag and the Con-

stitution behind it is as nothing unless backed up by life that is right and industry that is true

and honest."

In conclusion he said: "All that our Constitution and flag stand for are now at stake. Every individual is in the struggle to defend the rights of humanity. Every man in America who is doing an honest day's toil for an industry vital to the government can say just as truly and emphatically as though he were over in France with his gun against the breast of the enemy: 'I am an American.'

New Optical Glass Plants now Supplying U. S. Needs

THE War Industries Board authorizes the

following:

Optical glass, although not required in large quantities, is nevertheless an item in war operations and is important because by optical instruments much of the firing, especially of artillery, is directed. If the men are not equipped with adequate fire-control instruments or cannot see to aim properly, their firing can serve little purpose. A field army or a battleship without field glasses, telescopes, and other optical instruments is manifestly placed at a serious disadvantage.

Before the war little effort was made to produce optical glass in the United States. Manufacturers of optical instruments were able to obtain optical glass in desired quantity and quality from Europe and consequently did not feel the necessity for making it themselves. In 1912, however, the Bausch & Lomb Optical Company, of Rochester, N. Y., built an experimental optical-glass plant and placed a practical glassmaker in charge; by 1914 this company was able to produce a few types of optical glass which were

used in optical instruments.

By the end of 1914 the importation of optical glass had become difficult and uncertain. Other firms, as Keuffel & Esser, of Hoboken, N. J., and Spencer Lens Company, Buffalo, N. Y., and the Bureau of Standards of the Department of Commerce, at Washington, began to experiment in making optical glass. By 1917, when the United States entered the war, the optical glass situation had become critical. The European supply was practically cut off. Optical glass had to be made in this country if our army and navy were to receive the fire-control instruments

which they needed.

The geophysical laboratory of the Carnegie Institution of Washington was called upon to aid in the production of high-grade optical glass. A party from the laboratory was stationed at the plant of the Bausch & Lomb Optical Company in April, 1917, and for seven months all efforts of the laboratory were concentrated at this plant. At the end of 1917 the essential details of the manufacture had been developed and glass in considerable quantities was being produced. The efforts of the laboratory were then extended to the Spencer Lens Company and to the Pittsburg Plate Glass Company, Pittsburg, Pa. During this period the Bureau of Standards rendered effective aid.

At the present time, as a result of coöperation

between the manufacturers and scientists, large quantities of optical glass of the kinds needed for military fire-control instruments are being produced of a quality equal in practically every respect to the best European glass. The need for a continuous and assured supply of optical glass is so great that the workmen trained in the details of manufacture, and subject to draft, are being withheld from draft in order that their technical training may be utilized at this time. The required information and details of manufacture and the skill necessary for proper production have been gained at great expense and under high pressure.

"Optics for Photographers"

This book was written for professional and amateur photographers by H. Harting and translated by Frank R. Fraprie. It is intended to explain the fundamental laws of geometrical optics, on which depends the construction of photographic objectives, without introducing too many details. The contents are dependable, and we recommend the work as a handy textbook on this subject. Price, cloth, \$2.00. Supplied through this office.

"The Practical Exposure Disc"

There seems to be an unusual "crop" of exposure tables at this season, which signifies at least activity among out-of-door camera users. The latest to reach us is the "Practical Exposure Disc" manufactured by the American Photographic Publishing Co., of Boston, and is based upon the "American Photography Exposure Tables," which have enjoyed such a large sale for the past twelve years.

This new disc, with accompanying instructions

This new disc, with accompanying instructions and speed list, commends itself for the simplicity of operation and is thoroughly up-to-date by taking into account daylight saving time. It is

reliable and useful.

New Ansco Catalogues

From the Ansco Company, Binghamton, N. Y., we have received the "Ansco Catalog," "Professional Cyko Pointer," "Cyko Prints," "Ansco Speedex Film," an instructive manual. Every professional photographer can receive without charge "Portrait," a monthly professional publication of helpful information.

Resolution by the American Lantern Slide Interchange on the Death of Frederick Converse Beach

WITH our heads bowed in deep reverence and respect and our hearts filled with sorrow and yet gratitude—for well do we know he has gone where life is no longer a struggle, where all things are beautiful and good—we, the friends and associates of the late Frederick Converse Beach, of New York, a man of both literary and scientific talents, take this means of offering a just tribute to the memory of this co-worker, this man who has meant so much to us all.

We mourn for one who was most worthy of our respect and regard; one who was always willing, ready and most anxious to be of service to others; one who was charitable, in the true sense, in all his work of love, always cheerfulwithout thought of self and of personal desires, and we believe this Association was one in which he derived much helpful recreation.

By the death of this man, the community at large, as well as this Association, has suffered

an irreparable loss.

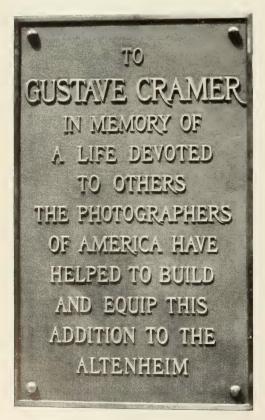
It is therefore resolved by the members of the Board of Managers of the American Lantern Slide Interchange that this testimonial be sent to the various publications known to be in harmony with the work in which he was so active.

W. H. Rau-Photographic Society of Philadelphia, Pa.

W. Schonewolf-Buffalo Camera Club, Buffalo, N. Y S. S. Johnson-Orange Camera Club, Orange,

O. C. Reiter—Photographic Section, Academy

of Science and Art, Pittsburgh, Pa. Organized in 1885 by Mr. Beach. porated under the laws of the State of New York, November 13, 1893. From the time of organization until his death, Mr. Beach was acting General Manager.



The Cramer Memorial

The Cramer Memorial Committee has finally disposed of the Fund of \$1500 by giving this sum to the Altenheim home for aged people, situated in St. Louis, Mo. The money has been used to help build and equip a hospital annex to his home.

The Altenheim was, for a good many years prior to Papa Cramer's death, a charity very close to his heart, and in helping them the committee have felt that in no better way could we use the fund contributed by his photographic

friends.

RYLAND W. PHILLIPS, Chairman of Committee.

Death of Rudolph Dührkoop

WE learn of the death of Rudolph Dührkoop. at Hamburg, Germany, on April 3d, in his seventieth year. Few photographers had a larger international reputation than Dührkoop and his work was well known here among professionals and pictorialists. The following, from the British Journal of Photography, proves rather

interesting:

"Dührkoop was in many ways a remarkable personality. It was not until toward middle life that he took up photography as a business. His youth was passed, like that of many others in his native town, in the counting-house of Hamburg. During the Franco-German War he served as a soldier, and his first acquaintance with Paris was on his entering it as a private in the German army after its capitulation. For some years after this he was still engaged in retail commercial business, but at about the age of thirty-five established himself as a professional photographer, and for some years produced nothing but the ordinary type of commercial portrait. Then, with a suddenness which was characteristic of his temperament, he took up an entirely different style of portraiture, in which his strong individuality asserted itself, and in which he renounced the use of the customary studio lighting for the effects obtained in a lofty room provided only with a high side-light. Subsequently a studio in the Hamburger Hof, one of the immense buildings facing the Alster See, was designed on these lines, and here Dührkoop founded a very great reputation and an extensive business among the civic and other leading personages of Hamburg. With the assistance of his daughter, Frau Minya Diez-Dührkoop, a studio was also established in Unter-den-Linden, Berlin, and from about the year 1905 Dührkoop was accepted as probably the leading exponent of pictorial photography, as applied to portraiture, in Germany, while the work which he contributed largely to photographic exhibitions received many awards.

"Of Dührkoop, during the war, we have heard nothing beyond the quotation of a letter from him in one of the American photographic magazines toward the end of 1914 or the beginning of 1915, the tenor of which, speaking from memory, was a prophecy to his good American friends of the speedy triumph of the German arms over the Entente European powers.



WORKROOM

ONTAINING THE LATEST PROCESSES, FORMULAE AND APPLIANCES NEEDFUL IN THE ART OF PHOTOGRAPHY FOR THE OPERATOR & WORKER

STOCKING THE WORKROOM SHELF INTENSIFYING WITHOUT MERCURY A RETOUCHING NOTE ALTERNATIVE METHODS FOR DRYING NEGATIVES RAPIDLY THE CHEMICAL SHELF THE PERFECT DEVELOPER OZOTYPE CONTROLLING THE LIGHT THE PHOTOGRAPHY OF METALS LABELS FOR BOTTLES IN THE DARK ROOM OVERWORKING THE DEVELOPER PHOTOGRAPHIC RESOLVING POWER RETOUCHING THE HAIR THE USE OF ARTIFICIAL LIGHT WITH SO-CALLED DAYLIGHT HOW TO MEASURE YOUR STOPS PROFILE PORTRAITURE THE PROPER MIXING OF SOLUTIONS AND CHEMICALS DRY COLLODION EMULSION SILVER INTENSIFICATION



THE WORKROOM

By the Head Operator



Stocking the Workroom Shelf

UNLESS the photographer intends to get his developing and printing done for him, in which case he can hardly be regarded as a photographer in the real sense at all, he will require a number of appliances and chemicals on his shelf in addition to the camera. They need not be very many, nor very costly; and the expense of the first equipment may be kept down by a

little advice.

What follows must not be taken as the irreducible minimum, nor is it suggested that one's course is not made easier by getting a little more than is indicated, but the things enumerated may be regarded as a fair average supply for anyone preparing to start work with a hand camera taking plates. For roll films it would have to be modified in one or two directions.

A dark-room lamp of some kind is a necessity, and this is usually provided by means of a ruby lamp to illuminate a room either at night, or with the window temporarily obscured. It is inexpedient to attempt to work by daylight filtered through glass or fabric, for reasons into which there is no need to go at the moment.

It is good policy to get as large and as powerful a dark-room lamp as possible; one of the greatest difficulties under which the beginner labors is that of trying to work properly, and to carry out unfamiliar processes according to instructions, in light in which he cannot see comfortably. Therefore a good lantern with a strong light in it not only makes work pleasanter, but contributes directly to make it more successful,

If the house is fitted with electric light, there is no need to buy a dark-room lantern at all. The ordinary hanging lamp with a conical opal shade can be turned into an efficient illuminant for the dark room by enclosing it in a bag made of two thicknesses of ruby fabric. This is a special material (not merely "anything red") which can be obtained cheaply through any dealer. It may either be stretched over some light wooden or cardboard framework, or used quite loosely as a bag, the mouth being tied round the flexible cord of the lamp, just above the shade.

When gas has to be employed as the illuminant the problem is not quite so simple, as ample ventilation has to be provided. In such a case most amateurs will probably prefer to buy a lantern. It should be arranged to take an incandescent burner, as this gives so much more

light.

For developing and fixing negatives and for making prints, dishes and measures will be required, and as these are very cheap, and work is made easier by having an ample supply, it will be well to get more than one of each.

The xylonite dishes are low in price, light and convenient in use, and practically unbreakable. They do very well for developing and fixing plates, and for developing prints, and two or three of the size that is to be worked should be bought. One which will take four plates at a time will also be very useful.

These dishes, it is important to bear in mind,

will not stand hot liquids.

A couple of deep porcelain dishes, "granitine" is a good sort, either half-plate or wholeplate size are very handy when a number of prints are to be washed at one time, but a couple of wash basins can be used in place of them, if expense at first is to be cut down.

Measuring glasses are used not only for measuring, but as developing cups, and it is therefore convenient to have two graduated up to four ounces each. A small one for measuring minims, and graduated up to two drams will also be required. Pints and half-pints can be measured with sufficient accuracy in an ordinary jug or tumbler.

As it is important not to contaminate the solutions used by putting them in a vessel that is not perfectly clean, it is best to get measuring glasses which are easily cleaned. In this respect it will be found that the cylindrical shape is

better than the conical.

Washing Tanks and Racks

Washing tanks and racks save a great deal of time when a number of negatives are developed at once. The beginner, however, should not attempt to work on a wholesale scale at first, and therefore may wait until he has had a little photographic experience before pur-chasing anything of the kind. Even then he will abstain if he is wise. Automatic washers on the siphon principle are apt to prove a snare. It is tempting to be able to dodge the, trouble of washing plates in dishes by hand; but the siphon washer cannot be left to work unattended. It has a trick of letting the water run out as it runs in, so that it stands part of the way up the plates, and if it is left like this more than a minute or so at the outside, it will leave an indelible mark across the plates.

A draining rack for negatives is not at all a necessity, especially when only a few plates have to be dealt with at any one time. So that it

also need not be bought at first.

A thermometer should be looked upon as indispensable for systematic work, and will save its cost in a very little while. It need not be graduated above boiling-point; in fact, no reading anywhere near as high as that will be required. It must have its scale completely enclosed in the glass, so that it is easily kept

clean. A "chemical" thermometer with a ring at the top by which it can be hung up when not in use is the best kind to obtain.

Printing Frames

In addition to the articles already enumerated, there will be required for printing a printing frame. If prints are to be made on P. O. P., or by one by one of the other daylight printing processes, it is a saving of time to get several frames, or only one print can be made at once; but if all the printing is to be on gaslight or bromide paper, one frame will be found quite sufficient.

It is a mistake to get the printing frame of the size to fit the negative; it should be two or three sizes larger and provided with a good piece of glass on which is a thin card with an opening cut in the center which will just take the negative. One can then print on paper larger than the negative, using a mask so as to get a white margin; while the prints which are only the size of the negative will not have the defective edges which are due to shadows cast by the printing frame itself—a very common defect in amateur work.

If there is any choice, it is best to get a well-made and well-finished printing frame, rather than a very cheap one. It has got to last. The writer has now in frequent use printing frames which he bought in 1892. They are still quite sound and serviceable; and, what is important, they have not shown the slightest sign of warping. A warped frame usually means a broken negative; and, somewhow, it is generally the best negative which finds out the faults of the frame.

There have been a variety of patent frames introduced at different times; but the ordinary pattern which has been in use for fifty years or more seems to hold its own, and is at least as

good as any other.

Nothing more need be bought at first, unless it is an eighty-ounce "Winchester" bottle—corked will do—for the stock hypo solution, and two or three pint bottles for developing solutions, etc. Squeegees, print trimmers, squeegeeing boards, and other similar devices are to be regarded in the light of luxuries—at any rate, at first.

It is possible also to do without scales and weights, and yet to work to formulæ. Large quantities—ounces or pounds—can be weighed on the household scales, if need be; but in most cases we can use the quantity of the substance which is bought, making up the whole of it into solution at once.

Such a solution may either be made to the formula in use, or it may be a stock solution of the substance itself. This allows us to get particular quantities of it, as required, by measure instead of by weight. Thus, if we dissolve an ounce of the substance to make eight fluid ounces altogether, we can measure out two ounces of such a solution instead of weighing out a quarter of an ounce of the dry chemical.

Probably the amateur will conclude that a pocket knife with its point as sharp as it can be made is all he requires for trimming purposes.—

Photography.

Intensifying without Mercury

I WONDER if the ingenuity of man could devise any more inconvenient intensifier than that in common use among amateurs-mercury-ammo-Unless the plate is absolutely free from hypo it will be irretrievably ruined, there is no control over final density, the results are not permanent, and mercury is a most deadly poison, which can only be bought from a chemist who knows the purchaser, and must then be kept out of the reach of other members of the household. I have lately come across a formula which has the following advantages: The plate may be taken from the hypo, just rinsed, and placed straight in the bleacher, without the awful stains mercury would produce; the formula may be easily altered to give any degree of density required; the results are quite permanent, and there are no poisons concerned. In addition, the chemicals used are much cheaper than mercury. Make up the following: Potassium bichromate, $\frac{1}{2}$ ounce; hydrochloric acid, 100 minims; water, 10 ounces. This is double strength. To obtain a very slight degree of intensification, dilute with an equal quantity of water; bleach in this, which will only take a very few minutes, then redevelop after slight washing in amidol. A greater density may be secured by using the bleacher at full strength; if still greater density is required, use at full strength, adding a few more drops of hydrochloric acid. Perhaps the best point about this method is that the tone values of the negative are not exaggerated, as is the case with mercuryammonia.

It is very often a great improvement to reduce the plate before intensifying; the bichromate will bleach quite as readily after reduction. The reducer used should be the usual ferricyanide-hypo, used very strong, as it is found that a strong reducer will attack the shadows first, and this will pave the way for a good clear negative after intensification.—*Photography*.

A Retouching Note

Possibly few workers realize that for the purpose of adding pencil work upon the film side of negatives they would have a difficulty in finding the equal of the "indelible" or copying ink pencil. It will be found that this tool will leave a very fine deposit after a light touch of a far less "grainy" texture than is the case when the ordinary black-lead and retouching medium are used, and the latter often has a tendency to spoil the fine surface of the negative, which becomes noticeable after overmuch enlarging. With the indelible pencil just described there is none of this, as retouching medium is not needed and a far lighter touch is necessary. One point should be noted; any deposit is exceedingly difficult of removal, and so when once applied had better be let alone. The writer has used the indelible pencil for all his retouching recently, and found it, with care, a most valuable tool. It may also be used for spotting purple-toned P.O.P., and as the color is so near to that of the print the work is hardly noticeable. We have also used it for spotting out pinholes in negatives, as follows: The point of the pencil is very

slightly damped, and the pinhole is then just touched. The transparency of the hole will be found to disappear, leaving it of the same density as the rest of the negative. The pencil should not be too wet, or too much spotting will be put on the negative. It should be damped with an oddment of flannel just damp with water.—Photography.

Alternative Methods for Drying Negatives Rapidly

Photography in a hurry often makes it necessary either to print or enlarge from a negative while it is wet, or to dry it in the shortest possible space of time. Several methods for the use of wet negatives have been recommended; but the fact remains that press photographers and others to whom minutes are of importance do not usually seem to regard the time which is spent in drying the film as time wasted.

In order that the drying shall take place quickly, the film of gelatin, to start with, should contain as little moisture as possible. is found one advantage to be derived from alum or formaldehyde. These agents not merely harden the gelatin so that heat can be used to speed up the drying, but they also cause it to contract, and in this contraction much of the water it originally contained is squeezed out. Hence a negative which has been treated with one or the other of these hardening preparations dries more quickly than one that has not, heat or no heat.

Formaldehyde (formalin) is, on general grounds, to be preferred to alum. Its action is more powerful, and it does not react with any traces of hypo, should the washing not have been thorough. A mixture of one part of commercial formaldehyde solution with five or six parts of water will in a couple of minutes make a film of gelatin so insoluble that boiling water will not affect it. The plate (film negatives cannot be dried so quickly) when taken out of the hardening bath may be wiped as dry as possible, and then be placed a foot or two above a gas stove or other source of heat, where it should be dry in less than ten minutes.

An alternative method is to put the hardened negative into a vessel of water, almost but not quite boiling. It is left in this for a few moments, to get hot right through, and can then be taken out and put to dry in a current of air. Its heated condition causes the drying to be very rapid. It is not advisable in this case to touch the surface of the gelatin before it is dry, however much it may have been hardened.

Where rapid drying is an operation of everyday routine, an electric fan with an arrangement for warming the air is often used. This serves to dry prints as well as negatives.—Photography.

The Chemical Shelf

A PERSON hesitating about taking up photography might well be given pause by the sight of the chemical shelf of some amateurs. The professional, by the way, generally confines himself to a very restricted variety of chemicals, although he may easily score over the amateur in the matter of quantities. But in the case of

some amateurs it is not a question of a chemical shelf, but of a collection of shelves, with a cupboard or so for reinforcements and reserves. Indeed, the amateur photographer often rivals the amateur chemist in the number and variety of his liquids and solids, his bottles and packages.

On the other hand, the person who was overawed by the chemical display of one amateur might be equally astonished at the collection of another—a collection which might be limited to a couple of bottles. He would be puzzled to decide whether photography necessitated elaborate chemical supplies and knowledge, or whether the chemical side of it was a minor matter of little or no importance. To whichever conclusion he came, he would be partly right and partly wrong.

The theory and practice of photography is inevitably based to a very great extent on the facts of chemistry. Without certain chemical actions, photography of any kind is impossible. At the same time a photographer can produce excellent work in great variety without any knowledge of the composition, manufacture, properties, and action of the chemicals that enable him to do that work. He may produce an excellent negative without knowing anything whatever of the solution he pours over his plate, or of the changes that take place in the emul-sion. He will not necessarily produce a better negative; even if he has sufficient knowledge to invent a developing formula of his own, and if he can explain most fully and accurately exactly what takes place in the reactions that transform his exposed plate into a negative.

There are some who send exposed plates and films to the proper quarters, and in due course receive in return negatives, prints, enlargements, or lantern slides. Many of them would be indignant at a denial of their claim to be photographers. Perhaps they may be recognized as

minimum" photographers.

There are others who themselves carry out the work in its entirety. They can produce a negative, and if they think fit reduce, intensify, or otherwise modify it; they have a practical knowledge of several printing processes; they make their own enlargements and transparencies. They may even choose to acquaint themselves with new methods and processes, or variations of older ones, and to do a certain amount of research and experimental work on their own account. Hence the wide variation previously mentioned.

Then there enters another variation. The photographer who is working over a wide field may provide himself with the means of carrying out the same operation in a variety of ways, and have at hand materials that are but rarely required. Or he may aim at reducing his stock by making a careful selection of those chemicals that will come in useful in the greatest number of ways; and he will give preference to those formulæ that make demands only on what he has, without the necessity of additions. One photographer will use a single reagent for his negatives, his bromide and gaslight prints, and his lantern slides; another will have one or several available for each class of work. good workman can manage with but few tools,

provided they are selected with knowledge and care; but he may be able to work more easily and expeditiously if he add to the number.

Again comes another variation. Many photographers prefer ready-made preparations in cases where they are available. Standard solutions produced by reliable makers have distinct advantages, and there is often convenience and economy in using packet and tabloid preparations. Other photographers incline to the use of scales and measures, and compound their own

solutions.

The photographer whose sole aim is to get the best, technically speaking, prints he can, with the least possible trouble to himself, does well to stop at the exposure, and have all the rest of the work done by experts. But neither course appeals to some others. They take an interest in the means, as well as in the end; in fact, to many there is a stronger appeal in the theory and practice of photography, with all that underlies both, than in the quality and merits of the actual results obtained.

So that it is a question of taste whether, between the camera and the print, there is or is not interposed a chemical shelf; and if there is, whether it shall hold an odd bottle or two, or

long or well-ordered rows.—Photography.

The Perfect Developer

The following practical note by Mr. J. A. Sinclair, F.R.P.S., appearing in *The Sinclair Sign-Post*, will be of use to many who are preparing for the development of holiday exposures. Every photographer discovers the "perfect developer" at some period in his career—a developer which will do more than anything else to correct errors in exposure, and bring out all the qualities needed for the ideal print. Each new discovery of the chemist, providing it is properly advertized, has its period of enthusiastic popularity. "Have you tried it?" says the latest convert to his friends. "I can assure you it is wonderful. I never got such negatives before. Really, all the results on my last holidays are marvellous." Then after a time comes reaction. Somehow, on another journey, the plates developed with the perfect developer leave much to be desired, while those taken by a companion on the same trip were excellent. Gradually it is forced upon the enthusiast that the developer was not at fault, and that his "perfect developer" was only perfect when the correct exposure had been given. We all go through this experience, and one so necessary to us if we are to realize that the perfect developer is the one which we understand the best.

In our case the perfect developer for negative-making is "Pyro." We have had our youthful enthusiasms for the "ens" and "ones" and "ols," and return to the oldest of them, "pyrogallol." Despite the valuable discoveries of the photographic chemist, we imagine "pyro" is as secure in its position as ever it was, and probably larger quantities are used today than ever before, although we quite appreciate the advantages of some of its newer rivals for special

purposes. And the causes for the popularity of "pyro" with the majority of the best workers are its cheapness, its admirable keeping qualities both in crystal and in solution, and its suitability for making concentrated solutions, of which only a few drops are required for developing a plate. Regarding its cheapness, price is a small matter, and does not stand in the way when perfection of result is desired. Fortunately, with pyrogallic acid, cheapness is not secured at the expense of quality, for the crystallized "pyro," which is sold in small bottles, is, in our opinion, not only cheaper but better than the old style in beautiful snow-flake form. The crystals not only economize space, but seem to make clearer solutions, probably because they keep better.

Then the immense advantage of "pyro" so far as concentration of solutions is concerned is at once manifest. From 2 to 4 grains of "pyro" are sufficient to develop a quarter-plate, and 1 ounce (437½ grains) quickly made up into solution will last most amateurs a considerable time. The formula we recommend for all-round

work is as follows:

Water to .

No.	1 Stock Solution, Label	"Pyro	10	Per Cent."
	Pyrogallic acid			1 oz.
	Potass. metabisulphite			1 oz.

No. 2 Solution,	Label	"	Soda	20	Per	Cent."
Soda carbonat	te .					4 oz.
Soda sulphite						4 oz.
Water to .						20 oz.

A simple plan is to get 10-ounce and 20-ounce bottles, and use them for the purpose of the developer. The quantities given are not quite correct scientifically, but they are practically, which is the main thing. An extra bottle may be had containing:

Potassium b	romide			1	oz.
Water to				10	07.

but bromide is rarely necessary with good plates. To develop, we usually take $1\frac{1}{2}$ ounces of water, add from 40 to 80 minims of 10 per cent. "pyro" solution, and make up to 2 ounces with 20 per cent. soda solution. We say from 40 to 80 minims of "pyro" solution, because some plates will not require more than 40, while others will usually want 80 if a strong and brilliant negative is required. Temperature is important, so far as time of development is concerned, and a temperature of about 65° F. is advisable. In very hot weather, or with plates prope to for from 10 to 20 minims of plates prone to fog, from 10 to 20 minims of bromide, 10 per cent., may be added to the 2 ounces of mixed developer. The time of development must, to a great extent, be left to the worker, and is "according to taste." In such a developer as we have described for bromide printing or enlarging, three or four minutes would be ample, but denser negatives made for platinotype printing should have about eight minutes.

Ozotype

Gelatin Ozotype

Gelatin ozotype is a modification of carbon printing, and possesses the great advantage that the image is plainly visible during printing, thereby dispensing with the aid of an actinometer. The transferring, which is necessary in ordinary carbon printing, is not required in ozotype, as the pictures are always the right way round.

The prints may be very easily worked upon with a brush during development, as in the gum-

bichromate process.

The main difference between carbon and ozotype is that in the former process the film of pigmented gelatin—i. e., carbon tissue—is sensitized, and after exposure to light is brought into contact with the paper which ultimately forms the base, while in ozotype the actual paper selected is sensitized, printed, and washed, and the insensitive pigmented gelatin film is placed upon it in the presence of a weak solution of acetic acid, copper sulphate, and hydroquinone. This solution acts upon the printed image, and an insolubilizing action proceeds upward through the film, and, at the same time, firmly attaches the insolubilized gelatin to the paper base. The gelatin unacted upon is subsequently removed by developing with hot water as in the ordinary carbon process.

As many of the carbon worker's troubles arise from insolubility of the tissue, caused by errors in sensitizing and drying, or by keeping the bichromated film too long in a sensitive condition, it will at once be seen that the advantage of using the tissue in an insensitive state is very great. It may be urged that the sensitive paper used in ozotype printing is likewise subject to deterioration, but as the cost is very little, this consideration does not out-weigh the advantage.

It is possible also in ozotype to expose and wash the initial prints while the paper is fresh, and complete the pigmenting operations after

many months, if more convenient.

Preparing the Paper

The printing paper is procurable ready sensitized, but the worker may very easily size and sensitize any paper which takes his fancy. The Ozotype Company¹ supply a sizing solution which, although a gelatin preparation, remains liquid at ordinary temperature. This can be rubbed over any good quality paper with a flannel or brush, and, when dried, the paper is ready for sensitizing.

The operation of sensitizing is exceedingly simple. The paper to be coated is pinned down upon a table, and a small quantity of sensitizing solution, mixed with a few drops of gum or colloid solution, is poured upon the middle of the sheet. This is spread quickly over the paper by means of a pad made of a handful of cotton-wool wrapped in a piece of fine flannel. Hardly any practice is required to get a nice, even coating of solution, but if any inequalities

remain, a piece of soft muslin or an old handkerchief, passed lightly across the surface, will put the matter right. If any fluff from the flannel remains on the paper it can be removed, when dry, by a fairly hard rub with the muslin.

dry, by a fairly hard rub with the muslin.

The surface is only sensitive when dried, so that quite a comfortable amount of light may be used for coating. The drying should take place in a warm, dark room—any ordinary darkened room with a fire in it will answer quite well. The paper will probably be dry in from ten to twenty minutes, according to the temperature.

The sensitive paper, now a bright yellow color, is printed in daylight until all the details, except very light clouds, are plainly visible. The image is somewhat similar to platinotype, though deeper in color. As the paper is several times quicker than P. O. P., the frames should not be examined in direct light.

The washing of the initial print is the most important operation in ozotype printing, as, if any of the unacted upon salts are left in the paper, the resulting picture will be fogged, while gross overwashing may produce a weak picture.

The washing is dependent upon the temperature of the water, the under-mentioned times

being generally sufficient.

Six to ten minutes in summer.

Fifteen to twenty minutes in spring and autumn.

Twenty to thirty minutes in winter.

If running water is not available, wash in not less than four changes of water for five minutes longer than the above-mentioned times.

If the paper is suspected of being slightly stale,

wash rather more.

The margins, caused by the rebate of the printing frame, should be quite white and clean when taken from the water.

The prints may now be dried and stored away to await the worker's leisure, or they may

be pigmented at once.

Pigmenting

The following concentrated acid bath should be made up, or it may be purchased ready for use:

CONCENTRATED ACID SOLUTION

Warm water .			10 oz. or	300 c.c.
Pure sulphate of	cor	per	14 dr. or	50 gm.
Glacial acetic ac	id		5 dr. or	18 c.c.
Glycerin			4 dr. or	15 c.c.
Hydroguinone			3 dr. or	15 gm.

This solution will keep good for many months.

WORKING BATH

Concentrated acid solution, as above . 4 dr. 12 c.c. Water 40 oz. 1000 c.c.

The diluted acid bath will keep good for about three days, and may be used for a number of prints in succession.

¹Geo. Murphy, Inc., New York, American Agents.

Prepare two dishes somewhat larger than the print to be pigmented, and pour into one the working bath and half-fill the other with cold

Place the print in the water, and a piece of pigment plaster (which consists of pigmented gelatin-coated on a paper backing) into the pig-

menting solution, face downward.

After about half a minute, turn the plaster face uppermost, and remove air-bells. Now take the print from the water, and draw it face downward along the surface of the pigmenting solution (to displace the water), and then bring it into rough contact with the plaster in the

Withdraw the two papers, clinging together, from the bath, and, with a flat squeegee, press them into absolute contact upon a sheet of zinc

or glass.

Note that the operation of bringing the print to the plaster in the pigmenting bath should be done rather quickly, otherwise the acid may weaken the print.

The print with its adhering plaster should now be placed upon blotting-paper or pinned up until ready for development.

At the expiration of about half an hour, immerse the plastered print into hot water at about 115° F., and in a few seconds try at the corner whether the papers are likely to separate easily. If such is the case, remove the backing paper with a steady, unbroken pull under the surface of the water. The print may now be developed by allowing it to float face downward in the water until the soluble gelatin is washed away, or development may be accelerated by placing the print upon a firm support, and pouring hot water upon it from a mug.

The print at this stage may be easily worked upon with a brush, which should preferably be

of Siberian hair.

When dried, the print is ready for mounting, though a preliminary hardening bath of 5 per cent. alum may be employed by the very careful worker.

Gum Ozotype

The ozotype method of printing can also be used for producing pictures in pigmented gum, but in this case the mixture of gum and color is not applied to the print in the form of a plaster, but is mixed with a small quantity of the gum ozotype acid solution mentioned below, and spread upon the washed image by means of a brush.

In addition to the convenience of a visible image, gum ozotype possesses several advantages

over the ordinary gum process.

In gum bichromate printing development takes place from the surface of the film, which has been insolubilized by exposure to light; consequently, the light half-tones of the picture have a certain thickness of soluble gum beneath them, instead of resting on the paper support. In ozotype the picture insolubilizes upward from the paper, leaving the soluble gum on the surface.

In consequence of this fact, the detail and gradation are finer than in the old process, and evenness of coating is not so essential.

Any depth of color is obtained with ease, thus avoiding the trouble of multiple printing

Any good quality paper may be used for gum ozotype, and it may be either thinly sized or left unsized, according to the worker's liking.

The sensitizing, printing, and washing should

be carried out as for gelatin ozotype.

The gum solution should be composed of one part of gum arabic to two parts of water, and it is in its best condition when it has been made up two or three weeks. A few drops of formalin may be added to preserve it.

The pigmenting solution is made as follows:

100 parts—say, 6 oz. Water Sulphuric acid (pure) 1 part —say, $\frac{1}{2}$ dr. Sulphate of Copper (pure) 10 parts—say, 5 dr. Hydroquinone 2 parts—say, 1 dr.

This solution will keep good for several months. For use take 4 drams of the gum solution, mix it with 2 drams of the pigmenting solution, and add sufficient pigment. Tube or moist colors are the best, and save much labor in mixing. The amount of pigment depends upon the effect desired and the particular shade used. Blues and blacks generally need very little, while light colors, such as red or warm sepia, require several times as much. The actual amount required can only be ascertained by actual experiment.

Pour the gum and pigmenting solution into a small mortar, and give them a stir with the mixing brush—a small, round paste-brush with the bristles cut short will answer quite well. Take with a penknife or spatula a small amount of color, wipe it upon the mixing brush, and stir with a gentle motion for some minutes. When the pigment seems to be fairly embodied in the gum, finish the mixing by vigorously stirring with the pestle.

The tint may be judged by dabbing a little on a piece of white paper, and spreading it with the finger-tip. Dark colors should appear much lighter than the required depth—for instance, black should appear a medium gray. It is better to use too little pigment than too much.

For spreading use a flat hog-hair brush, rather thick in the bristle. Charge the brush with the gum and color, and spread rapidly over the dry initial print with a circular motion. Do not attempt to get a smooth coating, but take care to spread the mixture over every part. Now take a little more color on the brush, and finish the coating by even strokes from left to right and from top to bottom, gradually diminishing the pressure until a fairly even coating has been obtained.

The coating may be completed by lightly dabbling the surface with a hog-hair softener, but

this is not strictly necessary

As the chemical action which produces insolubility of the gum only takes place while the film is in a damp condition, it is essential that the drying should be delayed for about half to three-quarters of an hour. This may be accomplished by hanging the coated paper, as soon as it had been spread, in a closed cupboard, at the bottom of which a dish containing water has been placed.

It is best to have the print almost dry before developing; it should therefore be hung up in a good current of air for some minutes after being taken from the cupboard. If more convenient, the print may be dried and developed

Development may be effected by simply floating the print face downward in a dish of cold water, finishing by softly spraying cold water upon it; but it is a better plan to start development by lightly passing a Siberian hair mopbrush all over the print, which will half-reveal the picture and remove most of the inequalities of spreading. Development may then be completed by soaking or laving with cold water, or by local work with a brush.

The print when dry is ready for mounting.

Controlling the Light

THERE is an old saying that the difference between a good photographer and a bad one is that the good photographer sometimes makes a bad picture and that the bad photographer sometimes makes a good picture. This is in a way true, but it refers more especially to the result of accidents or flukes than to premeditated efforts. We would rather vary the aphorism and say that a good photographer manages his light while the poor photographer lets it manage him. Now it is a curious fact that many photographers are in the latter class without knowing it. They have learned to make a passable negative with a particular arrangement of light, and beyond opening the blinds a little more on a dull day they never dare to attempt further modification; any essays which they may have made in this direction having had disastrous results. The really skilful operator knows no such limitations. blinds are in good running order, and his headscreens and reflectors do not suffer from lack of use, nor are they practically tied down to their places in the studio. During the year we receive many queries as to the proper way to arrange the blinds in a studio, on the aspect of the lights, and the question of top versus side lighting. Many of these are couched in terms that would lead one to believe that once the blinds were set they would never be altered. This shows a state of mind which is not conducive to artistic success, and we advise all who are in danger of falling into it to make a resolve to expend, not waste, a few boxes of plates in an attempt to become the master of the light instead of its slave.

It is obvious that the first step is to provide a few examples of the class of picture that is to be aimed at, and to keep these at hand so that they can be compared from time to time with one's own productions. When a satisfactory replica of each can be made with certainty, it will be time to try original effects, as it is much easier to judge the quality of a picture when a standard of comparison exists than to launch out with no very clear idea in view. It is profitable for the first essays in lighting to avoid the studio and to work with an ordinary window. Here we have a concentrated light which is more amenable to screens and reflectors than the diffused lighting of the studio. One of the

weaknesses of the old-style operator is a dread of cutting off too much light. We recall with amusement the derision with which a man with a life-long experience greeted our arrangement of blinds in his glass barn. He declared that the exposures would be impractically long, and was astonished to find that with very little increase over his normal timing a well-modelled image was produced instead of the flat all-overalike results which he usually obtained. On the other hand, under-exposure must be avoided. If a certain lighting appears pleasing to the eye, but is disappointing in the photograph, it usually indicates incorrect exposure, and instead of altering the lighting, the exposure should be increased or decreased until the visual effect

is properly rendered.

Very rapid plates rarely give as fine a scale of gradation as slower ones, and do not, as a rule, allow much latitude in exposure. Development should be full, but not carried to excess, as this will murder the best lighting in the world. It is a safe plan to develop by the factorial system, and not to attempt to judge the effect until the plate is fixed. This may seem absurd to the man who thinks he can make the negative in the developer, but it is the safest way. If the exposures are correct it is safe to develop a dozen plates in a tank, and the results will be more uniformly good than if each one were separately treated. And even if the exposures are not correct they are likely to give better prints than if the under-timed ones were forced up and the over-timed ones not fully developed. We have, it may be thought, spoken of exposure and development rather than of lighting, but the first essential of a good photograph is that it records all the tones of the original model, and this is what few photographs really do. Pleasing results may be obtained by falsifying the lighting by exposure, development, and faking, but it is easier and safer to build on the solid foundation of a correct rendering of the actual appearance of the original. A point which is often lost sight of is the desirability of using color-sensitive plates, as it is clear that with an ordinary plate very different values will be given to similarly lighted studies of a fair and a sallow sitter respectively. As to the actual arrangement of blinds and the size and position of light, we prefer not to dogmatize, as we should probably be leading the student into the slough which he is struggling to escape from. The only word of advice we offer in this connection is to work from darkness to light and not the reverse—that is to say, begin with nearly all the light cut off and gradually open the blinds until the desired effect is reached. The usual plan of cutting off the light after the sitter is in position tends to give flatter results, as the eye of the operator is often fatigued by the excess of illumination, and a false idea of the actual lighting created thereby.—British Journal of Photography.

The Photography of Metals. A War-time Application of the Camera

ONE of the most interesting of the applications of photography to industrial work is in the study of metals. The late Dr. Sorby, of Sheffield, was the first to take advantage of photography as a recording agent in this connection as early as 1864, and in recent years the subject of metallography has contributed

materially to the world's progress.

Metals in their pure state have only a very limited use in modern industries, as alloys of two or more metals are more suitable for many purposes, and although the art of alloying metals has been practised for thousands of years, it is only within the last quarter of a century that metallic alloys have been examined in a systematic manner. The importance of this branch of study is quite evident when we consider the extent to which metallic alloys are employed.

Copper is used in the pure state for electrical purposes, but the amount so used is only a fraction of that used for brass and bronze, and the use of wrought iron is insignificant compared

to the use of steel.

Let us briefly consider how photography assists

in the study of metal problems.

A specimen is first cut from the casting and one face filed flat. It is then rubbed on coarse emery cloth, the rubbing being done at right angles to the file scratches and continued until the file marks are completely removed. Successive grades of emery paper are used, and finally the scratches are removed by holding the specimen lightly on a revolving "selvyt" pad, using rouge as abrasive and water as lubricant.

The polishing produces an amorphous film on the surface of the metal, which is dissolved away by a suitable "etching" fluid. The constituents of the alloy are attacked unequally by the etching reagent, and the structure of the metal

becomes visible under the microscope.

Any form of microscope may be used for the visual examination of the specimen, but when photographic records are required, as is usually the case, it is advantageous to employ one of the special microscopes which have been designed for the purpose. These are fitted with exceptionally wide body tubes in order to minimize the reflection from the inside of the tube.

For illuminant, any bright light, such as incandescent gas, oxy-hydrogen light, or halfwatt lamp, is suitable, but the electric arc lamp with automatic feed is usual and perhaps the most satisfactory. A condenser is inserted between the light and reflector to concentrate the

the rays as much as possible.

Illumination by transmitted light is, of course, by the nature of the case, quite impossible, and oblique illumination is of limited application, being only suitable for quite low powers; for this purpose a parabolic reflector is

generally used.

For high powers the light enters the microscope through a small hole in the side of the body tube, and is reflected onto the specimen through the objective itself by means of a small prism or a glass disk at 45 degrees to the optical axis. This interferes to some extent with the illumination, but not at all seriously. The focussing is done by moving the stage of the

The camera used is built in several sections

to allow of suitable extension for low or high powers, and the whole apparatus must be fixed on a rigid support. The horizontal position is usual on account of the very long camera extension required, and the great difficulty that would be experienced in manipulating the apparatus in the vertical position. The focussing must be capable of being controlled from the back of the camera.

Two focusing screens are used, one of fine ground glass and the other of plain glass. The first is used for preliminary focussing, the size of the plate to be used being indicated by pencil lines on the ground glass. The portion of the specimen is chosen and focussed, and the lens stopped down if necessary until definition is secured over the area of the plate. The clear glass screen is then inserted and the image finely focussed by means of a magnifier. After exposure, the focussing screen is again placed in position and examined to see if any disturbance has taken place during the manipulation of the dark slides.

In cities, work at high powers has to be done after midnight when the heavy traffic is off the

streets, on account of the vibration.

In general, process plates are used, and in certain cases ortho, or panchromatic plates, with suitable screens, are necessary for selective contrast. The aim in development is to get sufficient contrast, as the general tendency is to produce flat negatives.

Prints are made on a carbon or semi-matt surface of bromide or gaslight card, as this reveals all details without the aggressive shiny surface. All particulars of the history of the specimen, the number of negative, etc., are written on the back of the print.

For temporary use, where prints are frequently consulted and correlated, a desk file is an advan-

Heat tinting is a method of developing the structure by gently heating the metal in air until the surface becomes oxidized. The different constituents are oxidized to different degrees, and many beautiful effects are possible. striking case of this is a steel or iron containing phosphorus. On heating, the carbide of iron becomes reddish brown, while the phosphide becomes at first pale yellow, then salmon, and finally the characteristic shade of heliotrope. Some very good work has been done in recording these heat-tinting effects by color photography, notably by the Autochrome and Sanger-Shepherd processes, and a very interesting field of work is here opened up in which color photography may be advantageously employed .-Amateur Photographer.

Labels for Bottles in the Dark Room

There are few photographers who have not been obliged at some time or another to throw away the contents of a bottle because the label has been lost. A little care in the preparation of labels will save those who do much work a great deal more than the value of the time they The following sugspend on them originally. gestions may prove useful.

The chief requisites of a label are: (1) It

must be easily read in the dim light of the dark room; (2) it must not become detached from its bottle; (3) it must not be affected by any drops

of solutions which may run down over it.

To secure (1) the label should be made of stout, white, opaque paper, and the words on it should be printed, not written, in waterproof drawing ink. The formula for the contents of the bottle should be given on the label to facilitate the compounding of solutions. Labels may be made very conveniently by ruling notepaper to desired sizes, and running along the lines on a sewing machine. The labels can then be detached at the perforations as required.

A good ink may be made from the formula

here given:

Oil of lavender1 oz.Powdered copal1 dr.Lampblack6 gr.Indigo2 gr.

Dissolve the copal in the oil with gentle heat, then add the lampblack and the indigo. This ink is indestructible and non-corrosive.

To prevent labels from becoming detached from their bottles, the following is an excellent adhesive:

Gum arabic 2 oz. Water 2 oz.

Dissolve and add:

Soaked gelatin $\frac{1}{4}$ oz. Glycerin 30 drops

and a small lump of camphor. Dissolve with heat.

Another adhesive recommended is white of egg beaten to a froth. Both bottle and label

must be bone dry before using this.

To ensure the immunity of the labels from destruction by corrosive chemical solutions some protective varnish must be used. If the solution is not corrosive, spoilt clean celluloid films may be gummed over the labels, the film being cut larger each way than the label, as celluloid adheres to glass better than to paper. One of the above-mentioned adhesives should be used.

A cheap varnish may be made by dissolving in

Methylated spirits 1 oz.

Allow to settle, and apply with a camel-hair

Another method is to size the labels (1 oz. of glue dissolved in 10 oz. of water); allow to dry thoroughly, the label being completely covered. As soon as dry, using, if possible, a brush of the same width as the label, varnish with either "oak," "copal," or "church" varnish. Two

coats are advisable.

A very simple but not very satisfactory covering for the label is melted paraffin wax, applied thinly all over the label, and onto the

glass at the edges.

Labels may be dispensed with entirely if the following ink is used. It adheres to glass excellently, and is fairly easy to read in the dark

Brown shellac 90 gm. Methylated spirits 160 c.c. Brown shellac . 90 gm. Dissolve; then pour slowly into a solution of

To the product add— Methyl violet 1 gm.

Any other suitable pigment may be used; the quantity may easily be found by trial. It is claimed that this ink is indestructible.—A mateur Photographer.

Overworking the Developer

The professional has been warned many times not to try to economize by making a solution develop more prints than it was intended to develop. It has been pointed out to him that when a developer becomes too weak to do its work properly, it should be discarded, otherwise washy flat prints of unsatisfactory color are certain to be produced. Rarely, however, has he been told exactly how much solution should be

allowed for a certain number of prints.

The trouble is, there are so many modifying factors that it is impossible to lay down a hardand-fast rule. Figures can be of real help only to the worker who is prepared to read them in the light of his own experience. Due allowance must always be made for the fact that postcards and heavy-weight papers soak up the solution much more rapidly than thinner papers. It should be borne in mind, too, that some printers waste a large proportion of their developers by their habit of snatching out the prints without allowing them to drain. With whole-plate and larger sizes, a substantial amount of developer may be wasted in this way with each print.

Another factor is that low-toned pictures with dark backgrounds will use up the developing agent much quicker than high-keyed, vignetted portraits. The reason is that in the dark pictures there is so much more silver salt to be reduced because so much more has been acted

upon by light.

It must be remembered, too, that a developer oxodizes very rapidly when exposed to the air in a shallow dish. For this reason a given quantity of solution will develop a certain number of prints if they are all put through while the developer is fresh; but will not develop the same number if they are put through at intervals and development is spread over a whole morning.

Other factors, such as the varying strengths of developing agents and the over- or under-exposing of prints, will suggest themselves to the experienced worker.

After all, the safest plan is for each printer to note very carefully how many prints he can develop in a certain quantity of solution before there is any slowing down in the action of the developer, or any deterioration in the quality of his prints. As soon as either of these signs appear, he may be quite certain that he has exceeded the limit; and in making his calculations for future working he should leave a liberal margin for safety.—Professional Photographer.

Photographic Resolving Power

Photographic resolving power is generally defined in terms of the distance by which two minute images lying adjacent to one another are just separated on the developed plate. In the judgment of the separation it is assumed that the image is so viewed as to be well within the resolving power of the eye and not magnified to an extent that will make the individual silver grains more apparent than their groupings. This is a logical definition, strictly in accord with that of the resolving power of optical instruments, but it should be pointed out that the measurement of photographic resolving power is not an angular measurement, but a linear one.

not an angular measurement, but a linear one. The method employed of determining this resolving power is that devised by Mees, and consists in accurately photographing a test object, a fan-shaped converging grating, divided into alternate light and dark sectors, each including an angle about 1.5 degrees. The minute image thus obtained, only 1 millimeter long, is examined under a micrometer microscope to ascertain the distance from its apex the image is resolved. The spacings of the grating and the scale of reduction being known, a numerical expression for the resolving power is found. Thus a value of 50 means that the plate or film under the conditions of the experiment is capable of resolving fifty lines to the millimeter, measured from center to center.

Photographic resolving power has been studied by the fan-grating test to ascertain the effect of exposure, development, developer used, and the wave-length of the incident light. It was found that resolution is, in general, extremely sensitive to time of exposure, over- and underexposure being decidedly detrimental. It also depends upon the time of development and upon the reducing agent employed. If two plates of the same emulsion, exposed equally and under the same conditions, are developed in different developers, the values of resolving power obtained vary widely, the greatest deviation from the maximum value being of the order of 40 per cent. with the developers tested. Thus resolution is not a definite property of an emulsion, but it is dependent also upon its treatment in the photographic process. With regard to the effect of the wave length of the incident light, resolution was best for light of the short wave lengths, with a decided minimum in the green, increasing again in the red, though not to as high a value as with blue light.—K. Huse, in *Journal of the Optical* Society of America.

Retouching the Hair

In portraits with dark backgrounds, individual straggling hairs projecting from the mass are a constant source of trouble to the retoucher. They catch the light and stand out against the dark ground like pieces of wire. Or, as often happens, a few hairs sharply defined come in front of a mass of hair which is markedly out of focus. In both cases, skilful scraping with the knife, followed by the pencil to even up the work, will soon remedy the defects. Very little knowledge of light and shade is required.

It is a different matter, however, when the whole mass of hair is too dark and has to be lightened up by retouching. This requires knowledge. It is one of those points on which the beginner is almost certain to go wrong. Careful observation of the living model, or the study of painted portraits, will soon show how the work on the hair should be applied. It becomes much simpler when it is seen that the light parts do not follow the direction in which the hair lies. Light is reflected from hair in patches which generally run across it in wavy bands. The beginner overlooks this, and tries to make each pencil line represent one hair. The result is that the hair looks like a wisp of straw or a ball of string.

The touch required is really quite a short line. It is hair in the mass, not a number of separate hairs, that should be represented; and it must be remembered that the patches of light should be neither too large nor too numerous. The darker

masses must always predominate.

The Use of Artificial Light with So-called Daylight Enlargers

Now that the opportunities for the use of the fixed-focus daylight enlarger are much fewer, and a good many of those who possess such instruments will be wondering whether it is not possible to use some form of artificial light with them. In most cases the answer is in the negative. The tiny single lens fitted to such apparatus is provided with a very minute stop, since with daylight the exposures will still be quite short, and the small stop gives a guarantee of good covering power and definition. Such a stop is prohibitive when artificial light is used. But if a fixed focus enlarger is constructed at home and fitted with a rectilinear, or, still better, an anastigmat lens, so that it is used at, say, f/8 or f/11, it is quite possible to make successful enlargements by means of incandescent gas or electric light, although, of course, the exposures will be lengthy. There is no need to get a special lens for the enlarger; it should not be difficult to make the camera lens itself serve the double

The light must be diffused, and this should be done with as little loss as possible. A good diffuser is made by taking a board and covering it with two or three thicknesses of white blotting paper. It should be a good deal larger than the negative—four times the area at least—and be placed behind it, making an angle of 45 degrees with it. As near to the paper as possible, but so placed as not to shine directly on the negative, is put the illuminant. If there can be two of these, then one may be placed on each side of the negative, and the white reflector may be parallel with the negative, and a few inches from it. Either arrangement gives a more even lighting than can generally be obtained by means of ground glass; but thin opal makes a good diffuser, though exposures with it are long. With the arrangement described, and rapid bromide paper, they are generally only a few minutes, if the negatives are not fogged.—Photography.

How to Measure Your Stops

It is extremely important at the present time that young assistants should be taught to understand thoroughly the exposure-values of their lens stops. Guess work or miscalculations lead to the under-timing or over-timing of exposures, and, with the present shortage of material, the resulting spoiled negatives not only mean a serious loss to the employer, but help still further to aggravate the manufacturers' difficulties in keeping up supplies.

Even a modern lens, with its focal length given and its stops plainly marked in "f" numbers, is puzzling enough to the beginner; but a lens of an old type or a foreign make, with an unknown focal length and its stops marked in figures he does not understand, is a riddle which is beyond

his power to solve.

The majority of professionals will remember being taught in their apprenticeship days that the "f" value of any stop could be ascertained simply by dividing its diameter into the focal length of the lens. They have found out since, no doubt, that absolute accuracy cannot be attained by this simple method. Strictly speaking, it is accurate only for a single lens, and then only when the stop is in front of the lens. It is quite near enough for measuring the stops of ordinary rapid rectilinears; but a more precise method must be employed for portrait lenses or modern anastigmats with large apertures.

When a photographer attempts to check the "f" numbers on a high-class anastigmat lens by this rough-and-ready method, he finds that his results do not agree with the markings which have been adopted by the maker. At first he may suspect the maker of exaggerating the speed of his lens—but this is a trick to which no reputable maker would stoop. The discrepancy between the maker's figures and his is due, in all probability, to his neglect of one important factor.

This factor, so often overlooked by the practical worker, is the difference between the effective aperture and the actual diameter of the stop used. When a stop is used between the combinations of a lens, the effective aperture is considerably larger than the stop opening, owing to the condensing power of that part of the lens which lies in front of the stop. The difference may safely be disregarded in a cheap lens working with a small stop; but it becomes a serious matter in an anastigmat lens working with a large stop, because the error is proportional to the size of the aperture

A simple method of finding the effective aperture was suggested by the Royal Photographic Society in 1901. It recommended that the camera should be set at infinity or the lens focussed on a distant object. A thin piece of opaque card should then be placed over the ground glass; and a small hole, the size of a pinhead, should be made in the card exactly opposite the axis of the lens. The camera should then be taken into the dark room and a lighted candle held near the hole in the cardboard. The effective aperture is the diameter of the beam of light which will emerge from the front surface of the lens. The easiest way to measure this beam is to fit a piece of bromide paper into the lens hood

with its sensitive surface close to the lens, put on the cap and expose for about half a minute with the lighted candle. The black circle, which will be found on the bromide paper after development, will indicate the effective aperture of the stop used; and, if the diameter of this circle is divided into the focal length of the lens, the true

"f" number can be ascertained.

If the focal length is not known, it can easily be calculated by focussing the lens successively at two different distances upon some suitable object, such as a foot-rule hanging vertical on the wall, or a square box placed upon the table. In each instance, the extension of the camera should be marked on the base-board and the height of the sharply focussed image marked upon the ground glass. Then if the height of the object in inches is multiplied by the distance between the two extension points on the base-board, and the product divided by the difference between the height of the two images on the ground glass, the result will give the focal length of the lens.—

Professional Photographer.

Profile Portraiture

JUDGING from the results, which furnish abundant evidence, there are very few photographers who really understand the portraiture of the profile. Many of the prints in the average photographer's collection indicate that while this method of treatment is in every way suited to the sitter, in nine cases out of ten the result is little short of a failure, owing to the fact that skilful operating was not forthcoming. A certain softness of focus is desirable, particularly in the nearer planes of the picture, and in most cases an absolutely sharp outline is decidedly objectionable. With regard to the background, a plain one of a neutral tint is most essential; nothing of a scenic or cloud effect is productive of the best The chief points are, however, in the poise of the sitter's head, and in the lighting, and the operator will find that these details well repay careful study and experiment, so that a certain effect may be deliberately obtained. Male models will rarely desire to be photographed in this way or be successful if they are; but with feminine sitters the head should be poised in as natural a manner as possible, and a slight inclination or lowering of the chin is to be preferred to a perfectly horizontal position of the head. This latter is a pose rarely successful, and suggestive in many cases of a stiff neck. One of the best profile portraits that the writer has ever seen was taken with a strong back lighting which gave excellent modelling of the neck and cheek. A good pose is what, for want of a better term, we may call a three-quarter profile, as this allows the cast of features to be sharply defined without the "head cut right in half" appearance so often seen in this class of work. It is generally an advantage, if the sitting is prearranged, to suggest that the sitter should wear dark clothing, as in this case a fairly dark background may be employed, and the highest lights of the print are just where they ought to be—i. e., on the features of the model. One more word may be added on developing. Most of the profile work that the writer has seen has been spoiled through overdevelopment, and the result is a print bordering on harshness. The operators have not realized that there is a distinct difference between a profile portrait and a silhouette. The effect to be aimed for is delicacy and softness of outline. The negative to be preferred is one that is only just enough developed for the shadow detail to print through, and every endeavor should be made to retain tone and modelling; for this is a full exposure and dilute development are ideal.—

British Journal of Photography.

The Proper Mixing of Solutions and Chemicals

A CONTRIBUTOR recently drew attention to the importance of properly mixing the developer before use, and his suggestion was valuable because many negatives are defective to a far greater extent than is suspected, owing simply to the neglect of proper mixing. In scientific photographic work, where results have to be critically measured in a photometer, the ordinary methods of the photographer are quite useless, for the plate will be full of easily measurable inequalities, due solely to imperfect mixing. In the case of a two-solution developer, for example, the usual method is to put, say, one ounce of solution A into a measure, add an ounce of solution B, with perhaps a few drops of 10 per cent. potassium bromide, and then fill up with water to the desired quantity. The result is then assumed to be mixed, and is poured over the plate in the dish, though, as a matter of fact, nothing like true mixture exists or can exist for several minutes after development has begun. Some parts of the plate will then start development long before the rest, while other portions will be locally restrained. The results may not be apparent in an ordinary negative, because the subject details will hide the defects, but a uniformly exposed plate lightly developed will show the inequalities quite readily. Some more careful workers try to ensure perfect mixing by pouring the developer back-ward and forward between dish and measure, or between two measures, but while this helps mixing it also accelerates the oxidation of the developer, and some developers are extremely sensitive to the oxidizing effects of air. It also leads to the formation of air-bells and spots on the negatives.

The only way to ensure perfect mixing with safety is to use a proper mixing measure. This is a tall cylindrical measure fitted with a stopper. One holding just the amount of developer required should be selected. The graduations enable one to add the right proportions of each of the ingredients with much greater accuracy than is possible with the ordinary conical measure, and when all are put together the stopper should be inserted. Mixing is then accomplished, not by shaking the measure, which aërates the developer and produces a plentiful stock of bubbles, but by gently reversing the measure several times. The measure being nearly full, only one large bubble of air is formed, and this travelling steadily up and down the measure produces perfect mixture more rapidly than is possible in any other way. If the measure is too big there is too much air, and the solution

splashes up and down, and gets oxidized, therefore several measures should be procured, each of a convenient size. Such measures are cheap, and can be obtained through any dealer. If graduated in metric measures practically any size required is available. Some firms who specialize in chemical glassware can also supply them graduated in ounces, though we believe the different sizes obtainable are rather limited.

Another advantage of these stoppered measures is the fact that the solutions can be kept in them as safely as in stoppered bottles, and it is always advisable to let a solution stand for a few minutes after mixing so as to permit time for diffusion to bring the mixing process to a perfect stage. The mixing process may disperse the several ingredients throughout the whole bulk of the solution, but if a little time for diffusion is not allowed the distribution of the different ingredients may be somewhat streaky and not quite uniform. This may be seen when a little very strong hypo solution is diluted with water. First the hypo and the water are quite distinct. Mixing distributes the one throughout the other, but still the heavy hypo solution can be distinguished in the form of oil-like streaks in the water, which streaks only disappear after standing a few minutes. It should be noted that violent shaking does not materially aid mixing. It rather hinders it by creating whorls and vortices that last a long time. Gentle stirring with a rod is more effective than violent shaking, though the natural tendency of most people is to put as much vigor as possible into the mixing process.

The mixing of liquids by the aid of a big air bubble passing up and down a long tubular measure is a dodge well known to chemists, who also have a peculiarly effective method of mixing dry chemicals. Naturally only powders can be mixed intimately, and crystals must be well crushed before attempting the mixing process. The various ingredients are roughly mixed together in a heap in the center of a large piece of paper, and then by lifting two opposite sides of the paper alternately the powders are caused to roll together backward and forward. The process is then repeated by lifting the other two sides of the paper, so that the powders roll in a direction at right angles to their first one, and a very few repetitions of the process produces about as perfect a mixture as is possible without much more elaborate appliances.

Another method of mixing solutions that we sometimes employ involves the use of a tall measure and a mixing funnel, the latter being simply an ordinary glass funnel with the stem bent at right angles, so that all fluid passing through it strikes the side of the measure and flows down the glass. The various fluid constituents of the solution are mixed together and then poured through the funnel into the measure three or four times. Mixture is fairly rapid, and no air bubbles are formed. It is, however, hardly a convenient method for developers, with which the stoppered tube measure is far the best expedient. The necessity of careful mixing in the case of developers can perhaps be better appreciated if we consider for a moment the conditions that prevail when bromide is added. It needs no

argument to show that a few drops of 10 per cent. bromide solution cannot possibly become instantaneously distributed throughout, say, half a pint of solution, and yet the ordinary method of mixing tacitly assumes that this is the case. Obviously the process must take time, and if we make no endeavor to mix properly the time really required may be fairly long.—British Journal of Photography.

Dry Collodion Emulsion

Generally speaking, collodion emulsion may be used for every kind of photographic work for which wet collodion or gelatin dry plates have hitherto been used. The treatment and method of handling will differ according to the purpose to which it is applied. We accordingly set forth the different processes, commencing with the oldest and simplest applications, such as to ferrotype plates, wood blocks, leading up to the more complex negative-making processes in which color sensitizers are introduced into the emulsion. First, however, we deal with the preparation of the glass plates.

Only new glass should be used, as scratches

show in the negative

The plates should be immersed in a strong caustic potash solution, if they are old negatives, so as to free the glass of the film. If they are new glass plates immerse them for a few hours in

Bichron			tass	ium	1	2 oz.
Sulphur	ic	acid				3 oz.
Water						25 oz.

Rinse under the faucet and polish with an alcoholic solution of caustic potash or iodine and finally polish with a clean pad of linen charged with a few drops of ammonia and alcohol. The plates cannot be kept clean for a long period, as the action of the atmosphere very soon forms a deposit on the polished surface.

The effect of unclean glass on collodion emulsion is much more marked than in the case of a wet collodion plate; the plates are to be coated with great care, as streaks and other imperfections on the surface will show when the

plate is developed.

It must be borne in mind that the surface of plate glass is considerably softer than that of ordinary sheet glass, due to the removal of the hard surface in the process of polishing.

The ordinary sheet glass is therefore less liable to be injured by an excessive immersion

in strong acid baths than is plate glass.

Substrata. In most cases the writer prefers polished plates without a substratum, applying only a rubber solution to the margins to make the film hold to the glass. If for any reason, however, a substratum is desired, the following can be recommended:

India rubber (best Para) . Anhydrous benzole (or chlo-	1 part
roform)	500 parts

This is flowed all over the glass, and may in more concentrated form be used for edging. Albumen is a useful substratum, and the following is a good formula:

Water .			80 oz.
Albumen			1 oz.
Ammonia			1 oz.

The substratum which we have found most reliable is given in the following formula:

		N	о.	1		
Gelatin .					. 50 g	ŗ.
Acetic acid						
The gelatin is	Wa	ırme	$^{\mathrm{ed}}$	until	dissolve	d.

No. 2 Water 3 oz. . . . Chrome alum 10 gr. Take ten parts of No. 1, one part of No. 2; Columbian spirits, 70 parts, and filter.

The plates must be dried in a room free from dust or in a drying cupboard. Heat can be applied and the plates will be ready for use within a It is, however, advisable to coat several plates, before wanted, so as to allow the acetic acid to evaporate and to cool the plate.

If the plate is not perfectly cold the ether in the collodion emulsion will evaporate during the process of coating and an uneven film will be

the result.

The presence of acetic acid also causes considerable decrease in sensitiveness, and is very marked in emulsions which are sensitized with ethyl violet.

A substratum is especially useful with emulsions which are not sensitized with Dr. Albert's sensitizers, as several aniline dyes have a tendency to make the film float off the glass. This is prevented by the action of the picric acid which is present in Dr. Albert's sensitizers.

À substratum will also be needed if the plates are to be developed with the hydroquinone developer, which makes imperfections in the glass and polishing marks visible. If glycin is used this precaution need not be taken. A mixture of hydroquinone and glycin has been found to answer even with ordinary polished glass, but for half-tone work hydroquinone alone will give the best results, and a substratum, preferably the last quoted one, will have to be used.

Coating the Plates. The emulsion is well shaken in the dark room for at least ten minutes, to get the bromide of silver particles, which settle at the bottom of the bottle after standing, uniformly and thoroughly dispersed in the emulsion. The operator should let the bottle stand for another two minutes and then coat the plate after dusting it well.

Most operators are well acquainted with the coating of the plate with collodion, but for the benefit of those who never worked collodion plates I will describe the right procedure.

Hold the plate in a horizontal position by means of a pneumatic plate holder, dust with a soft camel-hair brush, pour a small quantity of the emulsion into the center of the plate so as to form a circular pool, and gently tilt the plate first to the right hand and then to the left hand top corner, finally toward you to the left bottom corner and slowly drain back into another bottle from the remaining corner.

Do not tilt the plate too quickly and drain slowly, rocking the plate from right to left, so as

to avoid thin films and streaks.

As soon as emulsion has set (which can be determined when the finger makes an impression on the surface) the plate can be color-sensitized, or, if the sensitizer has been incorporated with the emulsion, it can be placed in the dark slide for exposure.

The dark slide should be carefully dusted before commencing the day's work, and wiped out clean at the end of the day to free it from drainings of emulsion. Dark slides which have been used for wet collodion work should never be used for emulsion, as the dry silver nitrate forms chemical dust which causes

black spots if it settles on the plate

The emulsion must not be poured back into the same bottle, but filtered into a separate bottle. Collodion pourers have often been suggested, but I believe have not proved a success. The pouring-on bottle should not be allowed to become covered by spilled emulsion, because the latter will dry and, peeling off, probably fall onto the plate during coating. This bottle and the tin in which it is stored should be kept spotlessly clean, the mouth of the bottle to be wiped after coating. Cork or rubber stoppers should not be used, as the former cause dust spots, and the latter possibly destroy the emulsion, if not made of pure rubber. Von Hübl suggested the following arrangement: Take a piece of wood about four inches square, and cut into this a circular groove into which mercury is poured. Into this groove place a light-tight circular cardboard box open on one end. Under this box the collodion emulsion pouring bottle is placed. The collodion emulsion pouring bottle is placed. bottle will now be protected from actinic light, and as the mercury forms a fairly air-tight compartment, evaporation of the solvents will be avoided. The top of the box will have to be made of (or covered with) lead, so as to make the box sink well into the mercury

Keeping Qualities of Emulsion. The collodion emulsion of commerce in its plain state before the addition of certain color-sensitizers, especially those which are silver compounds, will keep for several years. The addition of most sensitizing dyes does not impair its keeping qualities. If, however, silver eosine or other compounds of dyestuffs with silver are added, as, for instance, the sensitizers "A," "RP," "R," "P," of Dr. Albert, the emulsion will only keep a few days, and in hot weather probably only a few hours.

The life of collodion emulsion thus sensitized can be greatly prolonged by keeping at a very low temperature, and if such sensitizers are to be mixed with the emulsion, it is advisable to prepare small quantities, such as can be used up during the day's work. The newer sensitizers, as, for instance, pinaverdol, ethyl-violet, and homocol, can be mixed with the emulsion and it will still keep for a very long time, showing extremely clear working qualities.

Developers for Collodion Emulsion. Dissolve

	The fact of the contraction			
•	Sodium sulphite			$2\frac{1}{2}$ oz. 4 oz.
	Disillled water (hot)		4 oz.
And	add—			
	Glycin			1 oz.
And				
	Carbonate of potass	sium	1	5 oz.

The order of mixing as stated above should be carefully followed.

The solution forms a thick paste, and will keep for years if well stoppered. For use dilute:

Glycin	paste			1 part
Water				12 parts

This forms the usual developer. If greater density is required, the following developer is recommended:

Distilled water Sulphite of sodium . Carbonate of potash		20 oz 10 oz. 8 oz.
Hydroquinone Water, distilled		1 oz. 4 oz.
Ammonium bromide Water, distilled		1 oz. 4 oz.

Mix the three solutions and keep as stock. For use dilute one in ten,

This developer, introduced by Dr. Albert, does not keep so well, but gives extremely brilliant negatives of good density.

The density of the negatives can also be varied by increasing or decreasing the amount of hydro-

quinone in the developer.

Collodion emulsion plates can be fixed with hyposulphite of sodium or cyanide of potassium. The strength of the hypo solution should be about one in four.

Collodion emulsion plates must always be washed *before* development, because the alcoholic surface would repel the aqueous solution of the developer, and so cause streaks and markings.

The time of development should not exceed one and a half or two minutes. Development can be performed while the plate is held in the hand or in the dish. For uniform development the dish development is preferable, especially in color work. Accelerators or restrainers are of little use in emulsion work, where correct exposure is a desideratum. It will generally be found that the image on an accurately exposed plate appears in about thirty seconds in the hydroquinone developer, and in about fifteen seconds in the glycin developer.

The above formulæ represent the developers generally in use, and in the case of half-tone work are the only developers which will give good results. For ordinary continuous tone work almost any developer may be employed—adurol, metol, rodinal, all of which give negatives only differing in color and brilliancy, but equally good. A higher percentage of bromide in these devel-

opers will probably be needed.

The usual hydroquinone developer furnishes exceedingly clear but hard negatives, a quality most desirable in process work, but very objectionable in the continuous tone reproduction of an oil painting, for instance. Glycin yields considerably softer negatives, especially if used in a very diluted form, but the color of the negatives is of a yellowish brown, which, however, can be changed for a more beautiful bluish gray by a short application of very weak mercury intensifier and ammonia.

This will probably serve the additional purpose

of increasing the density of the negative, which is generally below the average for ordinary silver printing. The complaint often made that emulsion negatives are hard and devoid of detail in the shadows is not justified, because the softest and best graduated negatives have been made with emulsion by proper choice of developer and sensitizer.

A. Ferrotypes. Collodion emulsion can be used for the making of ferrotype dry plates for portraiture. The ferrotype plate is well polished with a few drops of alcoholic iodine solution, dusted and coated on a glass plate support.

To coat a ferrotype plate evenly is by no means easy. The plate should lie flat, and the surface must not show scratches or chipped-off parts in the enamel. Preservatives can be used if the plates are not immediately wanted. Chemically pure tissue paper should be placed between the plates when they are dry. Drying can be accelerated by means of a drying oven, or for small work a hot-water bottle or bath. To ascertain whether the plates are in good working order, one of them should be placed in the developer for about one minute without previous exposure, washed and fixed. The black enamel should not be dulled with the silver deposit, and the plates should look almost as if uncoated. Glycin and hydroquinone are suitable developers, the application of which should only last from fifteen to twenty seconds. The color of the silver deposit can be changed if different developers are used, but for most purposes the formulæ given will answer very well.

A. Solution 1 Distilled water 24 oz. Sulphite of soda (specially 10 oz. pure) Carbonate of soda 8 oz. Ammonium bromide 1 oz. Solution 2 Hydroquinone 1 oz. Distilled water 4 oz. Mix and label the solution A.

Developer for Ferrotype Plates

				В		
Carbona	ite o	f p	otas	ssiu	m -	6 oz.
Sodium	sulp	hit	е			12 oz.
Glycin						1 oz.
Water						20 oz.

Powder the sodium sulphite well and add the glycin after everything is dissolved. Mix and label the solution B.

Der erre bo.	acto						
				С			
Hypo							1 oz.
Water							10 oz.
For use ta							
A. 3 dra	ams;						
B. 3 dra	ams;	w	ater	, 9	dra	ms;	
C. 10 to	20	mi	nim	s of	wa	ter.	

This developer gives a white silver deposit, clear shadows, and its action is rapid enough for very fast work.

The addition of color-sensitizers, as pinaverdol, homocol, etc., gives very pleasing results, the coldness of the white image giving way to a

warm pink shade more resembling flesh tints. The plates are also speedier and work exceedingly

clear from fog.

B. Photographing on Wood. Collodion emulsion has been found very useful in photographing upon wood for wood engraving purposes, giving a photographic film which is thin enough to permit subsequent tool work without chipping. The wood block is coated in the usual way with white pigment mixed with gelatin. The edges and back of the block can be rubbed with wax

to make it water-proof.

The collodion emulsion of commerce is diluted with equal parts of alcohol and ether, and the wood coated with it in the usual way. The drying can be accelerated by placing a hot glass plate half an inch over the sensitized surface and by fanning the block. If conditions of light remain the same, it will be well to definitely ascertain the required exposure from a good standard negative at a given distance from the source of light, by covering the negative partly and giving a series of different exposures on the same block. The development is done in the hand and should be finished in about two minutes.

Any alkaline developer can be used, but we

strongly recommend the following:

Water						10 oz.
Metol						75 gr.
Sulphite						$1\frac{1}{4}$ oz.
Carbona						$1\frac{3}{4}$ oz.
Bromide	of	pota	SS	ium		10 gr.

Dissolve the metol in water before adding the sulphite. For use dilute with equal parts of water.

Glycin is not suitable, because the silver deposit is of a yellowish-gray color and does not show the fine details in reflected light. Fix in hypo solution 1 to 4.

A very weak solution of bichloride of mercury, and subsequent ammonia, will change the brown image into a bluish-gray one and make it more

visible.

It may be advisable to mix a small quantity of chemically pure glycerin with the emulsion, which will act similarly to a preservative and so ensure quicker development and more brilliant prints.

It is of great importance to wet the block as little as possible, and to see that nothing remains on the surface to clog up the point of the engraver's tool or cause the wood to become friable, making the delicate lines crumble and

break away.

C. Lantern Slides, Opals, and Transparencies. Although the collodio-chloride emulsion gives greater range of color, collodio-bromide emulsion will answer most purposes, and in the case of transparencies or lantern slides, which are to be made in the camera, will even become a necessity.

The opal or glass plate is well cleaned and polished with a solution of iodine in alcohol, edged with a rubber solution, or coated with a

substratum (see page 34).

The substratum is well filtered, the coated plates dried in a place free from dust and coated with emulsion. Care must be taken to shake the emulsion well before use, because the bromide of silver settles after standing for some time and

almost completely separates from the ether and alcohol when left undisturbed. The same modes of development, exposure, etc., as described for wood engraving are also to be used in this case.

If the plates are to be kept for some time before exposure the well-known beer preserver can be

used:

Pyrogallic acid 15 gr. Bitter ale (Bass's ale will do) 16 oz.

The plates are immersed in this solution until all greasiness disappears, then dried spontaneously. The above formula is from Sir W. Abney's Photography with Emulsions.

Another very good preservative is made by

dissolving

6 grains of gallic acid in 1 ounce of alcohol

Of this solution-

120 minims are mixed with 10 ounces of emulsion.

A good lantern plate of higher speed can be made by adding to this emulsion-

5 minims of

Pinaverdol solution, 1 to 500 alcohol.

This emulsion will keep for several months.

Silver Intensification

THE ideal method of strengthening a developed silver image would seem to be by the deposition of metallic silver upon it from a solution of a silver salt, much in the same way as a wet negative on a wet collodion plate is intensified. As many of us know, the silver intensification of a wet plate is about as perfect a process as any we have in photographic chemistry; but since the introduction of gelatin as the vehicle in place of collodion, silver has not been much

employed as an intensifier.

I do not intend to enter into the various methods of intensification that have been advocated since the early days of the gelatin dry plate. There have been very many, most of them containing mercury in some form or other, and of the vast multitude probably the best and most scientific is that one advocated by Mr. Chapman Jones, in which, after bleaching with mercury, the plate is darkened in a ferrous oxalate developer. It is my province to deal with the building up of the image by the deposition of silver upon it, the method being that given in my original formula, containing sulphocyanide and

hypo.

One of the most admirable qualities of this method is that it retains the same ratio of gradation which existed in the original negative. In certain cases, where it is necessary to obtain very great contrast, it may be found useful to employ one of the other methods, though I hope, later on, to show that even with the silver intensifier it is possible to alter the ratio of gradation,

when it seems necessary to do so.

Although the silver intensifier with sulphocyanide and hypo has been published for some twenty years, and has proved satisfactory in the hands of a few, for one reason or another it has never taken a strong footing among the many. There are one or two reasons for this. In the first place, it was found that the action of the

sulphocyanide so softened the gelatin that with some plates it actually dissolved the film. Then again, staining took place so badly with it at times that when intensification was carried to an extreme limit, so intense was the dichroic fog produced that its red stain in the clear portions was even more intense than the deposited silver.

If these faults could not be remedied, so that the process could be worked with certainty, it

was of no value for every-day use.

It is a curious fact, that with some emulsions there is no trouble from staining. Whatever the reason, we know so little of the complications that occur between the organic developer, the silver, and the gelatin, that it would be futile on my part to discuss the theory of it.

I may say, however, that I have noticed that with some formulæ for emulsion making, used under certain conditions, green fog is liable to be produced if pyro and ammonia is employed for development; and that the same thing occurs with my silver intensifier, with pyro and ammonia, or even if other alkalies are used in place of the ammonia. This points to the fact that there is some compound formed between the silver and gelatin.

Mr. Blake Smith two years ago published various formulæ for the clean working of silver intensification, as well as for getting rid of what he called "resin stain" of the developer. These methods were admirable in their way, from a chemical point of view, but the many manipulations required quite put it outside every-day use.

I felt so convinced that the sulphocyanide of silver intensifier was capable of good results that I determined to try to make it practically usable under all conditions; and I hope to prove to you this evening that I have done so. The whole secret lies in a nutshell. We must first attack the invisible compound of silver and gelatin which causes the stains. There are several which causes the stains. There are several reagents capable of doing this: copper chloride, potassium ferricyanide; acid bichromate being among the most successful I have tried, the latter being perhaps the most reliable of all, an immersion of the negative to be intensified for one minute in a very weak solution, followed by a two or three minutes' washing before it is placed in the silver solution, being quite sufficient to prevent all signs of staining.

The practical details are as follows: In the first place, it is very necessary to harden the film. A bath of formaline is therefore used, so that the plate will withstand the softening action of the suphocyanide. A soaking in a bath of one part of formaline to ten parts of water, for five minutes, is sufficient. This bath may be kept as a stock solution, and used over and over again. After a few minutes' rinsing the negative is placed in either of the following for exactly one minute, the bichromate being recommended

by preference:

Potassium ferricyanide Potassium bromide Water Or—		20 gr. 20 gr. 20 oz.
TTT .	•	1 gr. 20 gr. 60 min. 20 oz.

Too long an immersion in either of these baths causes the image to bleach, which we wish to avoid, if we desire to retain the original grada-In the time prescribed, there is little apparent change; but the reducing agent has done its work, and after a few minutes' rinsing the negative is ready for the intensifying solu-

The intensifier may be kept in the form of two stock solutions, which will keep good for years.

Silver nitrate 800 gr. Water (distilled) up to 20 oz.

Potassium sulphocyanide . 1400 gr. Sodium hyposulphite . . . 1400 gr. Water up to 20 oz.

Half an ounce of B is taken, and to it is added half an ounce of A, stirring vigorously with a glass rod. The result should be a clear solution; if the stirring is omitted it is apt to be turbid. To this is added 1 dram of a 10 per cent. solution of pyro preserved with sulphite, and 2 drams of 10 per cent. ammonia. The negative is laid in a chemically clean dish, and the silver solution poured over it. The deposition of the silver begins to take place in a minute or two, and the image gradually gains in strength. As soon as sufficient density is acquired, the negative is placed in an acid fixing bath, until the slight pyro stain is removed, and is then well washed, as usual. It is well to rub the surface of the film with a tuft of absorbent cotton at some time during the washing, to remove a slight surface deposit which will be found upon it.

There is one thing upon which I must lay stress, and that is that the negative to be intensified must have been thoroughly fixed in a clean, fresh, hypo bath, and not merely have been left for some indefinite period in a stale or dirty solu-tion of hypo that has been used on other occasions. This is important, but is a point on which I am afraid a good many photographers are apt

to be careless.

So far, the process, as described, does not alter the density ratios, merely increasing the vigor of the image proportionally right through. If, however, the original negative is flat from over-exposure, we may get greater contrast by carrying the intensification rather far, and then reducing with the ferricyanide and hypo reducer. Or we may allow the negative to remain in the clearing bath for a considerably longer time, until a decided bleaching action is visible. This bleached image is partially soluble in the silver solution, and so a portion will be dissolved, while the alkaline pyro will reduce the remainder. This treatment is on the whole not really satisfactory; so that I prefer to treat the intensified image, which, by the way, should be a trifle over-done, with the Howard Farmer reducer, as just described.

In a similar way we have it in our power to make a hard negative flatter or softer, by employing ammonium persulphate, this salt (in contradistinction to the ferricyanide) attacking the denser deposit first.

I need not point out the obvious advantage of being able to watch the growth in the density of the image, and to be able to stop it at the desired moment, which we have in this method. Moreover, the result is permanent.

It is not an every-day occurrence that a negative requires strengthening, but when the necessity does occur in the stock solutions at hand, it is only the matter of a very few minutes to remedy it, and the work may be done on the lines I have indicated, with the certainty that the solutions used have not deteriorated, and that the work can be done without any risk of a hitch, or of failure from staining, or from any cause whatever.

To Mount Paper on Metal. Make an adhesive of $\frac{1}{2}$ ounce gum tragacanth, 2 ounces of gum arabic, and 8 ounces of water. Dissolve and strain, using hot water for dissolving the gums. This is also a good adhesive for mounting prints on wood.

To Work with Crayon on Bromide Prints. Use powdered pumice stone to roughen the surface slightly, sprinkling the powder on the paper and rubbing lightly with the palm of the hand. This gives a good tooth for the crayon, but care must be taken not to make abrasions on the paper by too vigorous rubbing.

PATENT NEWS

Under this heading it is proposed to include each month a list of all the U.S. Patents; and brief abstracts of the more important, and to include also such foreign patents as present special features.

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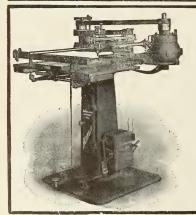


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THE BUSINESS SIDE OF COMMERCIAL PHOTOGRAPHY

By WILLIAM H. RAU.1

TIKE all other professions or business, photography requires business method and system to be financially successful, and it seems to me that few of the many men I know in commercial work use such methods as are used in other trades to get and hold

I think each one must decide certain matters according to his surroundings.

In the eagerness of a growing business I failed at first to see the importance of keeping accurate account of expenses, and realize that I lost greatly in waste of time and materials.

There are many ways of getting business, and next to a good show-case, kept clean and with frequently renewed ex-

¹ Mr. Rau is one of the best-equipped photographers in this country. Any word from his pen carries the wisdom of wide and ripe experience. We commend this valuable contribution to our readers.—Editor P. J. of A.

hibits, a well-worded typewritten letter of suggestion, written personally, is the best method of getting the attention of a possible customer.

If you can see your man, let him know that you understand your business, and don't belittle the other fellow who may be after the same work.

Have a system of handling all orders and accounts and have it as simple as possible.

Keep your business place clean—clean it every day. I have been in the business places of a number of photographers who never have the steps approaching their places swept or dusted and they wonder why they barely make a living.

I believe in using the best materials only and in having a full equipment of cameras, lenses, shutters, etc., and knowing how to use them.

Keep your promises if you have to stay up all night to do so.

(377)

Deliver your work neatly wrapped or packed, and have attractive labels.

Always use good stationery—not

postal cards.

Have every telephone order verified, if possible, by written order or letter.

Keep up your prices and give the best

for it and I know it will pay.

Learn how to estimate on complicated

orders and don't guess.

I have sent men to Europe, South America, and across the continent, and have learned to estimate the cost per negative of any size on a small or extended trip and a small order near home.

Don't claim to be the official photographer of any great manufacturing concern or railroad unless they officially recognize you as such. IT DON'T PAY.

Never let a print be delivered, whether unmounted or mounted, without your name placed clearly in a manner not offensive, and copyright any good thing you may make to which you have the right, as it gives the picture an increased value and importance.

would especially warn anyone against allowing a picture to be sold from any private negative ordered and paid for by a customer, and would have your employes clearly understand this.

In making pictures to be used in lawsuits, requiring the operator to appear in court, be sure to have an agreement in writing that you will expect payment of, say, one dollar an hour or more, according to the value you place on your time, in addition to the regular court witness

If you make large groups, either by day or night, be sure in selling copies to give a clearly prepared and signed receipt for the money, deliver promptly and replace any lost or damaged prints.

In my own business, I make it a point never to miss a chance to include some advertising, either in a package or in a letter, generally using a picture card with the legend: "We photograph anything, any time, anywhere," or some special announcement.

I find it necessary to read good books on business, system, and advertising, and try to keep myself well informed as to the progress of local and general events.

I learned by experience that success lies in punctual service, and that good business men do not defame their competitors, and that in business we realize that only honesty goes.

A good quotation says: "No man ever got nervous prostration pushing his business; you get it only when the

business pushes you."

No business long remains greater than the man who runs it. And the size of the business is limited only by the size

of the man.

Elbert Hubbard says: "The world bestows its big prizes, both in money and honors, for but one thing: and that is initiative. What is initiative? tell you: It is doing the right thing without being told. But next to doing the thing without being told is to do it when you are told once; that is to say, carry the 'Message to Garcia.' Those who can carry a message get high honors, but their pay is not always in proportion. Next, there are those who never do a thing until they are told twice; such get no honors and small pay. Next, there are those who do the right thing only when necessity kicks them from behind, and these get indifference instead of honors and a pittance for pay. This kind spends most of its time polishing a bench with a hard-luck story. Then, still lower down in the scale than this, we have the fellow who will not do the right thing even when some one goes along to show him how and stays to see that he does it; he is always out of a job, and receives the contempt he deserves, unless he happens to have a rich Pa, in which case Destiny patiently awaits around the corner with a stuffed club."

Why should men seek to overreach each other? And the answer is: There is no reason—the way to succeed is to keep faith with the customer and secure him as a friend. We make our money out of our friends—our enemies will not do business with us.

Again, Hubbard says: "If you work for a man, in heaven's name work for him. If he pays wages that supply you with your bread and butter, work for him, speak well of him, think well of him, stand by him, and stand by the institution he represents. I think if I

worked for a man, I would work for him, I would not work for him a part of his time, but all of his time. I would give an undivided service or none. If put to a pinch, an ounce of loyalty is worth a pound of cleverness. If you must vilify, condemn, and eternally disparage, why, resign your position and, when you are outside, damn to your heart's content. But, I pray you, so long as you are a part of an institution, do not condemn it. Not that you will injure the institution—not that—but when you disparage the concern of which you are a part, you disparage yourself."

The greatest mistake you can make in life is to be continually fearing you will

make one.

Coöperation, not competition, is the life of trade. There are three good reasons why all employees should have vacations.

One is so the employer can see how easily anybody's and everybody's place can be filled.

The next is so the employee can see, when he returns, how well he can be spared, since things go right along without him.

The third is so the employee can show the employer, and the employer can understand, that the employee is not manipulating the accounts or engineering deals for his own benefit.

And the man who lives during the year in anticipation of vacation does not deserve one, for he has not ascertained that it is work, and not vacations, that

makes life endurable.

And the man who keeps his system so strong and well balanced that he does not need a vacation is the one who will eventually marry the proprietor's daughter and have his name on the sign.

It does not take much strength to do things, but it requires great strength to

decide on what to do.

When you hire away faithful helpers from a successful institution, on the promise of big pay and in the hope of getting a world-beater, the rule is that disappointment awaits all parties concerned.

The man who leaves under these conditions has a yellow streak in his make-up.

More pay for more work is right and natural, but bigger pay in the hope that the man is going to make good in a new position is a gamble.

So the argument is this: Beware of hiring people away, or of being hired away, on promise of more money. If only the money catches you, you are

not a man worth while.

This thing of a salesman carrying his trade with him and considering the

trade with him, and considering the customers of the house his personal property, is the thought of only two-by-four men.

Now in reference to employees:

The very first item in the creed of common-sense is obedience. The man who quits in disgust, when ordered to perform a task which he considers menial or unjust, may be a pretty good fellow; but the malcontent who takes your orders with a smile and then secretly disobeys is a dangerous proposition.

Obedience to the institution—loyalty! The man who has not learned to obey has trouble ahead of him every step of the way. The world has it in for him continually because he has it in for the world.

The man who does not know how to receive orders is not fit to issue them to others. But the individual who knows how to execute the orders given him is preparing the way to issue orders, and, better still, to have them obeyed.

Quoting an eminent authority: "He has achieved success who has lived well, laughed often, and loved much."

Advertising is fast becoming an art, a science, and a business. Art is the beautiful way; science is the effective way, and business is the economic way of doing things.

We used to regard advertising as an economic waste. Now we look upon it

as an economic necessity.

Common-sense people all recognize now the value of letting the public know who you are, where you are, what you are, and what you have to offer the world in the way of commodity or service.

There are two reasons for advertising: One is to sell goods; the other is to create

good-will.

There is no finer way in the world to

lose money than through advertising—therefore the necessity of making advertising a science.

In order to make a business pay in this day and generation, it must be beautiful and it must be scientific.

Advertising demands a knowledge of psychology, and psychology is the science of the human heart. In preparing ads we deal with emotions, passions, tendencies, hopes, ambitions, desires. In one sense, advertising and salesmanship are twin sisters.

One need not argue that advertising

must be pleasing.

All advertising is literature and all

literature is advertising.

The greatest tax on humanity is not the tariff, war, strong drink, tobacco, or organized superstition. These things are all bad enough, but there is a tax more terrific than any of these, and that is the tax placed upon efficiency through inefficiency.

The number of workers who go ahead and do the thing they are told once is not large; most people have to be carefully supervised in order to get results.

Inefficiency comes from mental indecision with physical weakness and wrong

education as a causative base.

In an article on "Courtesy as an Asset," the writer says: "To the one who would succeed, I say, cultivate charm of manner. Courteous manners in little things are an asset worth acquiring. When a customer approaches, rise and offer a chair. Step aside and let the store's guest pass first into the elevator. These are little things, but they make you and your work finer."

Most inaccuracies come from not really listening to what is said, or not really seeing what you put down. The chewing of gum, tobacco, or paper, as a jaw-exerciser, should be eliminated. The world is now pronouncing them vulgar, unbusiness-like, useless and silly.

If your business is to wait on cus-

tomers, be careful of your dress and appearance. Do your manicuring before you reach the studio. A toothbrush is a good investment. A salesman with a bad breath is dear at any price. Let your dress be quiet, neat, and not too fashionable. To have a prosperous appearance helps you inwardly and helps the business. Give each customer your whole attention, and give just as considerate attention to a little buyer as to a big one.

There are houses known by courteous telephoning. Telephone courtesy is a big thing, as courtesy always is. Loss of

temper gains nothing.

According to Fra Elbertus: "Business is eminently a divine calling. We do not differentiate it from any other calling, no matter how noble, how beautiful, how altruistic. There is a romance of business, and a heroism of business, that literature will yet take note of. antique phrase about the three learned professions will have to go. There are fifty-seven varieties of learned men. To do your work with a whole heart up to your highest and best is an eminently religious motive. And, when in doubt, to mind your own business is eminently ethical and wise. Enlightened selfinterest endorses the Golden Rule.'

Health is the most natural thing in the world. It is natural to be healthy, because we are a part of Nature—we are

Nature.

Nature is trying hard to keep us well, because she needs us in her business.

Nature needs man so he will be useful to other men.

Action is the one law of Nature. Everything is in motion.

Keep at work. Have a vacation and an avocation—a job and a hobby.

Do not overeat.

Do not underbreathe.

Live out of doors as much as possible. Work, play, study, laugh—flavor all with love, and you have the key to the situation.

SCIENTIFIC PHOTOGRAPHY

Some Effects of Photographic Chemicals without the Aid of Light

By "CHEMIST"

THAT some photographic chemicals (nitrate of uranium in particular) are capable of producing a developable image without the aid of ordinary light, either natural or artificial, may be readily demonstrated by carrying out the following simple instructions by any person who may be desirous of investigating a little beyond the surface of ordi-

nary photography.

To produce developable images upon gelatin plates by means of the *alpha* rays emitted by nitrate of uranium, particularly when combined in a convenient form with plaster of Paris and peroxide of hydrogen, may at any time be readily made by the employment of a dried slab or block that has been prepared with the above material. The proportions well suited for the purpose are as follows:

Formula for the Plaster Slab

Plaster of Paris (dental) 5 tablespoonfuls Nitrate of uranium . . . 120 grains

Dissolve the nitrate of uranium in two ounces of water, then add

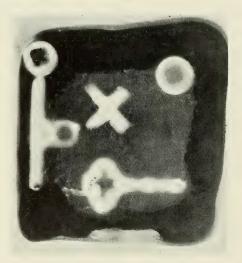
Peroxide of hydrogen . . $2\frac{1}{2}$ fluidounces.

Stir the mixture well while adding the plaster, when a yellow oxide of uranium will be formed and incorporated with the plaster, resembling a thick yellow cream. Pour this mixture into a frame made of wood strips one inch high and resting upon a slightly greased glass plate so arranged that a block about 4 x 5 inches will result. A 5 x 7 glass plate will be just the thing, the wooden frame being held in place by a couple of rubber bands, a little dry plaster being banked all around the outside so as to absorb any liquid that might ooze through. Every scrap of the mixture must be placed in the space to form the block.

As soon as the mixture has become thoroughly set, which will require about one hour, the wooden sides may be pulled apart and the block removed from the glass plate by a sliding action. The rough edges being trimmed off, the block will then be ready for use, either wet or

dry.

It must be clearly understood that *all* the operations for radiographic experiments must be conducted in a dark room, where the ruby light is produced by at least *two* deep ruby sheets of glass; that all operations be carried on as far away from this illumination as possible; that the plaster block be kept at a distance until required for use, and that the objects to be produced be placed upon the sensitive plate or plates with no squeezing or pressure, so that no images are produced by stress.



F G 1

Fig. 1 is a very unusual radiograph. It was produced by placing the objects upon an ordinary $3\frac{1}{4} \times 4\frac{1}{3}$ sensitive gelatin plate; two thicknesses of black paper carefully wrapped around the whole; a thin 4×5 glass plate placed on top and the damp plaster block placed upon this plate; then placed in a small closet, lined with black paper, and

(381)

allowed to remain in complete darkness for twelve hours. At the end of this time the plaster block was removed, the package opened and the objects removed entirely under the non-actinic ruby light, and the plate developed in a black hard-rubber tray with another inverted hard-rubber tray completely covering the whole. Upon examination, at the end of fifteen seconds, a perfect radiographic plate was the result. At the end of one minute, development was complete, and the plate was washed and fixed, when, upon examination, the result proved to be a negative formed by a complete reversal of the image. This astounding result was the reverse to the usual radiograph, which is a diapositive or transparency. The true cause of this reversal appears to be due to the presence of oxygen in the peroxide of hydrogen.



FIG. 2

Fig. 2 and Fig. 3 were made by cutting objects out of tinfoil that had been dipped into hot paraffin so as to form an insulated surface; then placed between two sensitive plates, $3\frac{1}{4} \times 4\frac{1}{4}$; the whole being carefully and lightly wrapped in a double thickness of black paper and placed in a dark closet, the dried plaster block being carefully placed on top, and the whole being allowed to remain in total darkness for fifty hours. The plaster block was then removed, the wrapping also, and the two plates developed (covered completely so that no extraneous light could act upon them). Development was completed, the plates fixed and washed, when, upon examination, it was found that the top

plate was found to be a *negative* and the bottom plate a *diapositive*. The true

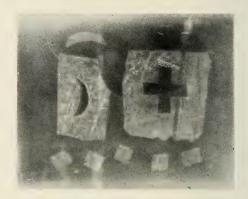


FIG. 3

explanation of this extraordinary phe-

nomenon is still a puzzle.

Fig. 4 is a print made by placing a steel key, two steel binders, a cross cut in insulated tinfoil, and a black paper cross, the whole being then covered with a glass plate wrapped securely in black paper. The dry plaster block was placed on top and the whole shut in the dark closet for twenty-four hours. The plate was then developed, resulting in a diapositive or transparency; this result being the reverse to the previous tests.



FIG. 4

Fig. 5 is a radiograph produced by placing several small lumps of pitchblende upon a 4 x 5 sensitive plate, carefully wrapped as before, and kept in the dark for forty-eight hours. Then the plate was developed, producing the result shown in the illustration.

The developer used is here described for the benefit of those who are desirous of carrying out some of these unusual scientific experiments. It may be stated that it is not advisable to carry or push the development too far, because this



FIG 5

will bring about a fogged plate, caused by chemical decomposition of the haloid silver salt in the gelatin film. Afterintensification may be resorted to, providing the plate is thoroughly well washed, to free it from any trace of hypo that may be left therein.

Developer for the Radiograph Plates

Hot water	10 fl. oz
Paramidophenol hydrochloride	
(kodelon)	30 gr.
Hydroquinone	40 gr.
Sulphite of soda (dry)	
Carbonate of soda (dry)	4 dr.
Potassium bromide	9 gr.
Ammonium bromide	12 gr.

When this preparation has become cold it will be ready for use.

The fixing solution may be made from any of the formulæ given for dry plate and film fixing. Thorough washing is essential after fixing, when the plate is completed. Prints may be made from this by any of the well-known paper processes.

A thin film of gelatin may be interposed between the objects and the sensitive surface of the plate without materially affecting the result, so as to prevent any possibility of producing impressions of the objects by stress.

PRACTICAL PANCHROMATISM IN THE STUDIO

To the photographer who keeps level with the times, there is probably little to be said concerning the general advantages of the panchromatic plate. For the photography of furniture, the copying of paintings, and for many other purposes, its superiority is obvious —in fact, it is indispensable to success. But the remarkable fact remains that in portraiture we go on in the same old way, photographing everything by blue and violet light, entirely regardless of effect.

The reasons are, perhaps, not far to seek. Apart from the conservativeness which seems inherent in the majority of professional photographers, there are two main objections which stand forth. First is the increased exposure consequent on the use of a color screen, and second,

perhaps, the increased cost of working. My object is not only to show that the advantages of the panchromatic are sufficient to swamp entirely any such objections, but also to show that the objections themselves have very little real foundation in actual practice.

Less Retouching

Probably the principal advantage in many minds will be the marvelous manner in which retouching is minimized. Every retoucher is only too familiar with those light brown freckles and color-markings, which are only barely visible to the eye, but which sorely try the patience on the negative. Then, again, wrinkles, as we all know, are usually rather redder than the sur-

rounding parts; and these, as well as the innumerable color markings which occupy some three-fourths of the retoucher's time, may be represented truthfully, without exaggeration, and at their visual color value.

I am not for a moment suggesting that it is possible to *abolish* retouching by this means—the public has become too accustomed to a perfect complexion and a more or less god-like facial contour to appreciate a photograph which is merely truthful. But my own experience has shown that at any rate some 50 per cent. of the retoucher's work—and time—can be saved by the panchromatic. Surely this alone is sufficient to justify the extra cost.

Furthermore, it gives an opportunity to the photographer who likes to send out a number of rough proofs, but who does not feet justified in retouching the lot. A proof from an unretouched panchromatic, although it will not flatter the sitter, will certainly not disgust her, as the ordinary unretouched

proof has been known to do.

Blonde Sitters

But there is another consideration which, although it may not save any time or labor, is important because it tends strongly to increase the photographer's reputation with his public. Who does not know the fair-haired sitter who "never can get a photograph in which her hair comes out nicely?" The usual method of doging with fair hair is not only troublesome, but inevitably lightens the shadows overmuch and produces washiness. then there are the light blue eyes which give the operator so much trouble in lighting, and the sunburnt holidaymaker whose face is so brown as to be almost black to the plate.

Here is the opportunity to score. Such sitters have in many cases come to feel that there is something wrong with their eyes and their hair, which always "take badly." Give such sitters a color-correct photograph, and your reputation goes up at once. The same thing applies to reds, browns, pale blues, etc., in dresses—those shades

which cause such disappointment when the proofs are sent home.

While in the studio, however, let me give one word of warning. Shadows in the face are usually warm in tone, and a lighting which may be all that can be desired in the ordinary way may be found rather flat on a panchromatic. All that need be done is to make the lighting *slightly* stronger—a very little will usually be quite sufficient.

I have dealt lightly with the advantages of the color-sensitive plate because a little reflection will readily show the enlarged scope which it yields, especially in the direction of an enhanced reputation. My principal object is to show the real insignificance of the objections

which may be raised.

A brief exposure is, especially with nervous sitters, undoubtedly a great advantage. But at this time of the year the majority of photographers have discarded the rapid plates used throughout the winter, finding that a plate of about half the speed is much more convenient. Now a fast panchromatic plate, exposed through a light screen, will require no more exposure than an unscreened plate of the usual summer rapidity, and yet give a very marked improvement. With a K_3 screen it is still possible to obtain a fully exposed negative in the studio with an exposure of two seconds at f/6, and my experience has led me to the conclusion that the great majority of sitters can be relied on for double that time. Moreover, the K₃ screen, although requiring only about five times the normal exposure, will give complete color correction—a point surely well worth remembering.

The Development Bogey!

Some objections may be raised as to the difficulty of handling the plates during development. Undoubtedly such plates are best filled in and developed in darkness, but I have found that plates sensitized in the manner I am about to suggest can be handled quite safely at a distance of three or four feet from a Lumière "Virida" safe-light, using a 16 c.p. carbon lamp. I need scarcely say that the plate should be exposed to

the light no more than is necessary. But by using a tank all risk of fog can be obviated, as the plates can readily and conveniently be filled in in darkness by means of the loading block, and development done entirely by time. In any case, whether development is effected by tank or dish, it will be found quite as simple as when dealing with ordinary plates; for my own part, I always put both kinds into the tank together, using the green light for inspection if necessary. And here I may say that I do not for a moment suggest that the ordinary plate should be ousted entirely—it does its work perfectly where there is little or no color, especially if the head is small enough to require but little retouching. Moreover, in photographing children the shortest exposure will generally be required. But in the ordinary run of work the day's exposures may require to be about equally divided between the two.

The Economy of "Pans"

Next, as to cost. This may be urged as a great objection by those who are compelled to work at low prices, in view of the fact that panchromatics cost from two to three times as much as ordinary plates. But is this much? I think it will be found that the saving on the retoucher's time will cover it easily. Nevertheless, no one, I fancy, wishes to see his plate bill doubled, and I therefore suggest a simple and practical method of bathing, by which the cost of plates is but slightly increased, and at the same time the dark-room routine is not unduly upset.

Home Sensitizing

In the ordinary way, the bathing of plates is a very messy and trying operation where more than a few have to be done at once, as anyone who has attempted it without special arrangements will know. There is the difficulty of avoiding air-bells in the dye-bath, the danger of uneven sensitizing through irregular rocking or subsequent improper washing, and the trouble of drying—to say nothing of the doubtful pleasure of standing about in total darkness for a

quarter of an hour or more. I have experiended these and other difficulties, and was led in consequence to experiment in order to find some simpler and safer method.

Drying Arrangements

It is necessary, in the first instance. to provide some sort of drying cupboard. Most photographers, I suppose, possess something of the kind; in any case, it forms a most useful adjunct for a variety of purposes, such as the rapid drying of negatives, prints, carbon tissues, etc. The one which I have used with success was cheaply constructed of matchboard in a spare corner of the dark room, and heated by the flue from a small enclosed oil stove. This stove serves the additional purpose of warming the dark room in winter, and the flue carries all smell to the outside air. A gas jet fitted with an old incandescent burner would perhaps be a more convenient source of heat. As a matter of fact, any disused cupboard can be made to serve, if an inlet for warmed air and a corresponding outlet can be provided. The inside can be papered with black paper plate-wrappings and the door can easily be made light-tight. The interior of the cupboard may be conveniently arranged to take racks in which the plates are held vertically. The thermometer (readable from the outside) is important. I find that plates dried quickly tend to keep better, but at the same time the temperature must be kept well below meltingpoint. A temperature of 75° to 80° F., will dry the plates readily in an hour if the inlet and outlet be sufficiently large.

How to Bathe Plates

The operation of bathing was the principal difficulty. Using a large dish in the ordinary way, I found it impossible to handle more than seven or eight half-plates at a time, on account of the difficulty of rocking quite evenly in the absence of any light. All attempts at larger batches showed uneven action; in a few cases I obtained in addition a fine crop of air-bells, which, of course,

show themselves on development as

insensitive spots.

No doubt much of this might be overcome by using three or four times the amount of dye solution, but such a procedure would be very wasteful, and would bring the cost very near that of the commercial article. And my experience has been that it is inadvisable to use the bath more than twice in any case, as the dye is soon precipitated, and settles on the plate, causing innumerable tiny highly sensitive spots.

Finally, I found that the most successful and convenient method was to use a tank. This obviated all difficulties as to unevenness and air-bells (which I find can always be avoided by lowering the cage slowly and steadily into the tank), and reduced the period of actual dark-

ness to a minimum.

Making the Dye-bath

The dye-bath usually recommended is a 1 to 50,000 solution, and I have found that 500 c.c. at this strength is amply sufficient for two dozen half-plates—probably it would suffice for a much larger quantity. Now a 7 x 5 developing tank requires about 1600 c.c. to cover a dozen plates, and as it is inadvisable to use the same bath repeatedly for the reason already stated, I cast about to discover how far it might be safe to dilute it.

I first used a bath diluted to ten times its bulk, *i. e.*, 1 to 500,000, and immersed for ten times the usual period. The dried plates were then tested by exposing through a K₃ screen on a color chart. The result, although showing considerable color-sensitiveness, was far from satisfactory, being similar to that obtained by means of a fully sensitized plate with a K1 filter. Moreover, as might be expected, the multiplying factor of the screen was decidedly increased.

After some little experimenting, I found that a dye-bath made up as follows gave perfectly satisfactory results, the color-rendering with the K₃ screen being, for all practical purposes, perfect:

Pinachrome				
alcohol)				4.75 c.c.
Pinacyanol	(1	to	1000	
alcohol)	`.			3.25 c.c.
Water				1600.00 c.c.

The alcoholic solutions keep well, but the dilute bath should be mixed only before use. Plates may be filled into the tank by the green light, and should remain for eighteen minutes. I have not found it necessary to reverse the tank, the sensitizing being quite even if the solution is well mixed before hand.

On removing the plates (which is best done in complete darkness), they must be thoroughly washed under a running tap for several minutes. This I found rather awkward, having only three taps, thus the operation became somewhat prolonged. I overcame this difficulty very easily, however, by taking a piece of clean lead piping, some five feet long, hammered up at one end, and boring holes with a bradawl about $\frac{3}{4}$ in. apart along one side to form a continuous spray. This I suspended at a height of about twelve inches above a board of the same length placed over the sink. The lead tube was connected to one of the taps by a piece of rubber tubing, and the plates placed face upward on the board. With the water falling in a steady shower it is a perfectly simple matter to place the plates and wash thoroughly without a light and without loss of time.

After five minutes' washing the plates should be lightly wiped over with a piece of clean absorbent cotton and placed in racks in the drying cupboard.

The whole operation (excluding the time while the plates are in the tank, when they may, of course, be left to themselves) need not take ten minutes and the cost for one dozen half plates is well under twenty cents.

One word of caution must be added. The tank must be thoroughly washed if it is to be used afterward for developing. Where possible, it would undoubtedly be better to keep a separate tank for sensitizing.

It may be asked how such plates compare with the ready-prepared article. The only point of difference appears to be in their keeping qualities. I have found that the bathed plates, if well washed, can be relied on for a month after sensitizing—longer than this I have not tried them—while the bought plates are supposed to keep for six months. In the studio, however, a month is ample.

With regard to color-rendering, I can find no difference. And even when using a "Virida" light rather freely, I

have never experienced more fog than the ordinary proportion of bromide would have prevented. Finally, it is, to my mind at least, something of an advantage to be able to go on using the plate to which one is accustomed, and the advantages and capabilities of which are well known.—George F. Greenfield, in *British Journal of Photography*.

GETTING MORE BUSINESS

II. MAKING PEOPLE WANT PICTURES

By J. CLYDE WILSON

CIRCUS recently set up its vast paraphernalia near my home, and in the evening I wandered down through the grounds to take in the strange sights and freaks that always accompany this great enterprise. remember, across from the gounds, a great crowd was gathered about a hawker who stood on a box in the uncertain flicker of a blowing gasoline torch and sold jim-cracks. I say "jimcracks" advisedly, for in my interest in his efforts I did not notice just what he was selling; but I do know that he was holding his audience, in competition with the "barkers" across the way, with remarkable success. He was a grizzled veteran at the game, possessed of a keen sales sense, and like every good salesman he was a man of broad sympathies, with an almost uncanny appreciation of human nature.

With all of the clatter of the "balyoo" in front of the side-shows he had no trouble whatever in holding his audience. Indeed, it grew as the evening passed. He started out boldly, I remember, by telling a story. He began slowly, with measured cadences, in a wonderfully effective voice, a humorous tale about his "good friend Jim." Then followed some good jokes upon himself, at which everyone laughed good-humoredly,

while his eyes twinkled and he pawed over some of the merchandise he was about to offer for sale. He intimated that he was a very human fellow, who often fell from grace and had an intimate acquaintance with the devil—this with a wink. By these various devices, practised with some refinements by the accomplished speaker, he quickly got into close touch with his audience and thereby won its confidence. With this start it was an easy matter to lead up to the subject of his goods, while retaining his audience with unexpected but tried witticisms, and they were soon elbowing each other out of the way to deposit their dimes upon the upturned suitcase which acted as his rostrum and counter combined.

The various courses through which this speaker led his audience in working up sales of his merchandise is followed more or less closely in creating sales of all kinds. The advertising man likes to dogmatize and say there are four distinct steps:

- 1. Attracting attention.
- 2. Developing interest.
- 3. Creating desire.
- 4. Securing action—or purchase.

It is not possible to divide the processes preceding every sale in just this way. One merges imperceptibly into

the other with no distinct line of demarcation. But one thing is certain, it is necessary to abstract attention from other things momentarily and cause it to be concentrated for the time upon the article featured. In other words, you must draw attention to your place of business and your goods—make people think of them—before they will buy them. That is why merchants put signs in front of their stores; build great windows; select sites on busy thoroughfares, and generally attempt to get close to as many people as possible.

Every business has ways of doing this peculiar to itself. Some lines enjoy particular advantages in this respect—have a larger popular appeal and guarantee a profit that makes extensive advertising possible. Others are not so blessed, and must meet the situation by ingenious and original methods. I think photography is one of these.

Some photographers, however, have not been slow to find wherein photography too enjoyed special advantages, invaluable if properly handled. Some of the conspicuous successes in the craft have been the outcome of ingenious use of the fact that photography is an art. By developing an original and personal treatment, so that their pictures stand out and have an individuality of their own, many photographers have become famous, as indeed they deserved, because this is the true function of art. When one has the talent to express himself with individuality he has something to offer for public consumption of distinct value, for there can be no other source of supply, and those who are attracted by it must naturally turn to the artist for it. It is this that makes it possible for some photographers to charge what seem like exorbitant prices and get it, while others cannot easily sell work at onetenth the price. You can get the latter kind anywhere and so it suffers greater competition. Good art is without competition and if enough people know about it it is bound to sell.

It is not given, however, to every photographer to be an artist. Artists are born and not made. With most of us, photography is a business, and so is subject to all of the laws and methods which govern the sale of merchandise. I am afraid photographers too often forget this. They have an unprofitable notion, because some do so, that all photographers stand in a class apart. It is not so. The photographer in nine cases out of ten is just a plain businessman and it is better for his purse and comfort to act accordingly-not forgetting, however, that the more artistic his product, even at that, the better from a business stand-point. He has to meet the competition not merely of other photographers, but, as I have often pointed out, of merchants selling other lines as well. The man who draws his pay on Saturday night has only so much to spend. Some of it must go for the common necessities. From the surplus come such extras as pianos, phonographs, autos, vacation-trips, and photographs. To make a man want photographs, to give away to others at the expense of these things which he can personally enjoy, you have got to make a photograph something that is very interesting to him. And that has been one of the troubles with photography it is not well-enough advertised as something everybody should want and buy often.

When the "Photographer in Your Town" series of advertisements were projected a great step was taken in the right direction, but photographers have been slow to see their opportunity by hammering hard locally in conjunction with this effort. Indeed, want of local coöperation has been responsible for photographers losing a great deal of business that could certainly be had for the asking. In most of the cities we have, each year, a get-together meeting of the dealers in automobiles to boost spring business by giving an exhibition at which the new models are shown. The success of these shows is undoubted, for the dealers are able to finance them by means of admission fees charged. The electrical dealers give a similar exhibition, so do food purveyors, the builders of motor-boats, poultry breeders, and others. Photography enjoys an unusual power to attract attention, and yet outside of the open-days at some of our photographic conventions, and the

Kodak Exhibition, I have yet to recall a single exhibition for business ends projected by professional photography on any large scale. The very interest that the amateur exhibitions create augurs well for a project of this kind. A big public photographic exhibition in our cities each fall, before the holiday rush set in, would do a great deal to put photography before the public as a live, progressive business, and I hope some live local organization will take this suggestion up and act upon it. Such an undertaking, being of a public nature, would lead to write-ups in the papers, discussion of the pictures shown, and a wholesale reproduction of the best pictures in half-tone in the feature pages. It would offer the opportunity for page spreads featuring the advertisements of local photographers, and create more than one resolution to have pictures made. Above all, it would give the business a new character—an appearance of enterprise it sadly lacks.

The individual photographer can capitalize this idea in a small way himself. In fact, it is frequently done. I recall one photographer now who has an annual exhibition of "The Season's Debutantes." What a shrewd appeal to women that is! What woman wouldn't go out of her way to see some fine pictures of society's "buds" just coming out? He fitfully surrounds this event with all the trappings and formality of a social function, and if you are one of the "four-hundred" you receive your engraved invitation to attend. If your daughter was "comingout" next year, wouldn't you see to it she got her picture into the next exhibi-

tion, and exhibited in the papers at the time, as always happens? This photographer gets a great deal of notice and much free paper publicity out of this—and it pays.

An unfailing way to advertise a studio is by your mere presence in person, or by the presence of one of your assistants, at every function of a public or quasipublic nature, where it is possible to secure admission and take a picture. This quickly familiarizes a vast number of people with your activities and your work, and also results in causing your pictures to become known to a vast number of those who might not have heard of you in years. Gatherings of this kind bring individuals together from many local groups and these go back to advertise you further, like a great expanding voice, taking a sample of your work with them, perhaps. It is like advertising by chain letter. One tells two, and these tell as many more, ad infinitum. Few lines of business enjoy an opportunity of this kind, and I have yet to see it fail where handled with business acumen and judgment. It is not to be forgotten, further, that the typical American loves enterprise and push. It is one of our ideals, and we are all plugging for the man who isn't afraid to hustle. "That's our middle name"—as the Yankee drummer likes to say. Making people want pictures is not such a subtle thing after It is a matter of making them think pictures at every favorable opportunity.

(To be continued)

HINTS ON ARTISTIC MOUNTING

ALTHOUGH there are still many professional photographers who do not realize the importance of tasteful and distinctive mounting, it is pleasing to note that a great change—one might almost say a revolution—is taking place with regard to this phase of our

work. It is, of course, the photographer with a high-class clientèle who is particularly affected. He finds that his customers are getting more and more dissatisfied with the stiff mechanical appearance of the machine-made mount; that they require something more individual;

with more character—in short, to employ a much-abused word, something more artistic.

This improvement in the public taste, which I think is largely due to the excellent educational work on the part of the amateur pictorialist who keeps himself in the current of progressive ideas, should certainly not be ignored by enterprising professionals, who, as a class, by the way, are far too apt to ridicule where they might derive much benefit from study of the amateur's work. The effect of a more progressive attitude to fresh ideas would certainly tend toward generally improving the status of the profession and, incidentally, to better prices.

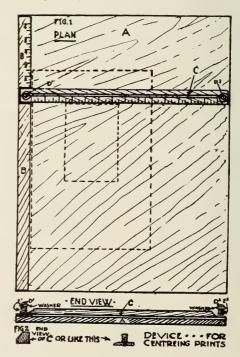
That the home-made mount, which by the judicious use of "tints" and papers of varied textures can be made to yield an almost infinite variety of effects, and harmonizes with any print, is incomparably superior to the machine-made article goes without saying; but can it be made a commercial success? I believe it can, but before going into that side of the question I want to note some general points on this type of mounting.

Many a good picture struggles for recognition as such in a frame entirely out of harmony with its style and tonelikewise many a good picture fails of appreciation because it is not properly mounted. We might almost say that the best mounts or frames are those which are least conspicuous—those which are subdued in tone and do not clamor for attention as against the picture. Obviously, if the mount is the obtrusive part of the finished work the picture will receive secondary consideration, and, handicapped, is not in its proper setting. Therefore, in making your mounts, let simplicity be the keynote. The actual selection of colors is largely a matter of taste, but a rule which may be safely followed is to use tints which follow the color of the print. Contrasts may, it is true, be used to advantage in some rare cases, but for success in this the best of taste is essential—otherwise the print will lose its charm.

The flexible mounting paper—sometimes described as "Art" mounting paper—can be obtained from any of the

leading photographic supply houses, and it is advisable to get a good selection of colors and textures and to give each photograph individual attention, trying various combinations before finally deciding. Generally black prints look better against a light or dark gray (or even white) than they do upon brown, while sepia prints usually tone better with buff or brown than with gray.

In making these flexible mounts it is best to leave the natural rough edges. If the paper is very rough in texture cut the other edges with a paper knife not with the trimmer, and you will have quite good rough edges all round. The margins around the print should be about equal at top and sides, with *considerably* more at the bottom, and, above all, do not make your mounts too small. Nothing looks more poverty-stricken than a small flexible mount. About quarter of a sheet is a suitable size for a half-plate print.



The illustration shows a very handy device which I have fixed up for "centering" the prints on the mounts, and which is suitable for prints and mounts of any size. It consists of a board, A (a half-

imperial drawing-board is excellent), with a strip of wood, B, fixed at the lefthand side. Another strip, C, cutting through B at right angles, moves up and down on the screws D^1 and D^2 , but is kept down in position by the weak spiral springs E^1 and E^2 . The strip B may be quite thin, but C should be shaped either as shown in Fig. 2 or a flat ruler may be used, strengthened by an upright strip, fixed by little screws underneath. Mark inches (down to eighths will do) on B, commencing at the lower side, C, which should also be marked, but not numbered. If a ruler is used the numbers should be covered over.

To center the print or tint proceed as follows: Lift C slightly, push the mount underneath, center the print by means of the ruler, C, and find the margin required at the top on B. The print can then either be tipped on at once or the position of the top corners can be marked off with a hard lead-pencil. This may seem rather involved, but after a little practice it can be done quite rapidly. If the mounts are made in standard sizes it facilitates matters to have their centers marked on C.

Plate-marking is, of course, also effective, and, indeed, in the case of rough grained papers, almost essential, unless a rather thick "tint" is used. If the mounting press cannot be used for this purpose, sham but effective looking platemarks, useless for suppressing the grain, but quite good otherwise, can be produced in the following way. Place a piece of thin cardboard or mounting paper cut to the exact size of the plate-

mark required in position on the mount. Turn the mount over and place on an even surface, taking great care not to move the card. Now take a paper knife, and, pressing fairly hard, go round the edges of the cardboard. If the edges are sharp and cleancut a well-defined platemark will result. This method is rather too slow to adopt regularly, but will serve all right for an occasional job.

The name or monogram can be placed on the mounts with a die-press in either raised or sunk type, although, on the whole, the latter is best, being suitable for both thick and thin mounts, and less liable to get out of order.

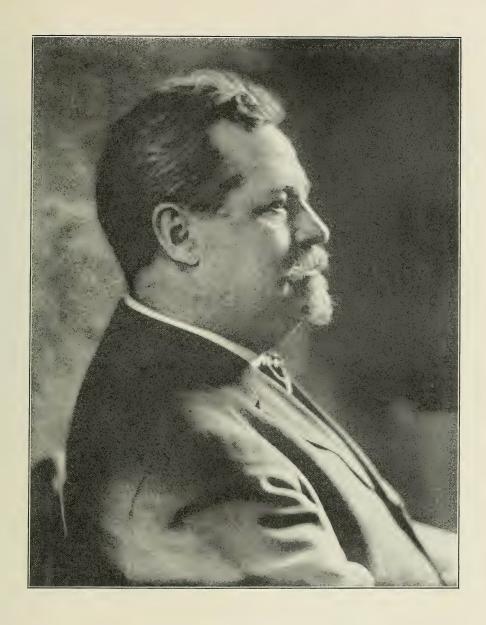
If time is no object, and it really does not take long after all, a neat little monogram or "trade mark" in pencil is perhaps the most effective of all if properly and not too prominently placed.

In conclusion, I should like to point out that if home-made mounts are to prove a commercial success a roomy, well-equipped workroom is essential, for one of the main things is to save time —time being money. Do not, above all, make the mistake of trying to keep down costs by using inferior materials. Consider that every photograph sent out is an advertisement—good or bad—and a photograph displayed in the best possible way means the best possible advertise-Therefore, use good materials ment. and deal with the matter of keeping expenses down by saving time, by working in a systematic way, and adopting as many labor-saving devices as possible. In that direction lies success.—British Journal of Photography.

THE DAY HAS COME WHEN AMERICA IS PRIVILEGED TO SPEND HER BLOOD AND HER MIGHT FOR THE PRINCIPLES THAT GAVE HER BIRTH AND HAPPINESS AND THE PEACE WHICH SHE HAS TREASURED & GOD HELPING HER SHE CAN DO NO OTHER



THE RAU ART STUDIO
PHILADELPHIA, PA.
SHOWING SEVERAL DEPARTMENTS



WILLIAM H. RAU RAU ART STUDIOS PHILADELPHIA, PA.





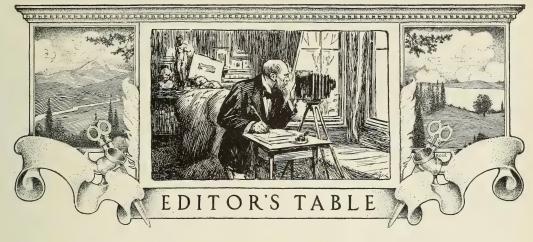
ADMIRAL DEWEY'S FLAGSHIP "OLYMPIA"

BY RAU ART STUDIOS, PHILADELPHIA, PA.



SAFE DEPOSIT VAULT

BY RAU ART STUDIOS, PHILADELFHIA, PA.



A FRESH START

WITH the beginning of September, business, which is always more or less (generally more than less) demoralized during the summer months, resumes its course, and the photographer should be ready to seize the earliest opportunity that offers during these

stirring times.

With everybody returning to town it is a good time to remind your customers that there is never a better time to have the children photographed than when they are tuned up after a vacation and before a busy school term. The Army and the Navy and the folks at home present constant possibilities. A suggestion is the only thing a great many people need. They have the willingness but they need to be shown how important it all is.

With the close of the summer season it is to be hoped that the photographer will cut out some of the foolish things he

does during the heated term.

It is certainly time to make a fresh start and get down to better methods. The man who is offering his fellow-townsmen eight dollars' worth of goods for three dollars is giving them credit for a very small amount of intelligence and holding photography up to the contempt of the business section of the community.

If you are cutting prices and making similarly foolish offers, make a fresh start. Do not be content to keep on making poor work and asking poor prices. Make better work. A determined effort will do it, and get better prices. When the next dull period comes along, and your competitor begins to make foolish offers, go and have a talk with him. He may be open to argument. If he is not, a line of advertising to the effect that quality cannot be cheapened or put into work that is offered at less than half its regular value will do you more good than to make a similar foolish offer.

Make a fresh start. There is always hope for the man who is willing to make a new beginning. Improve your output and increase your income. The men on Fifth Avenue, New York, were not born there. They started in the small towns and worked up. Merit always counts. If you are not satisfied with your work and your business, make a fresh start. The opportunities are better than ever.

ON REMODELLING THE STUDIO

A GOOD many changes occur at this season of the year, not only in the proprietorship of various studios, but also in the studios themselves. Redecorating, refurnishing or at least a complete and thorough overhauling and cleaning is everywhere in order, while in many cases the entire studio is altered and rebuilt to conform more nearly to the modern conditions under which its business is being done.

We deem it not unwise to drop a hint regarding the importance of care in planning the changes and carrying out the alterations so that every possible advantage may result without the necessity of subsequent changes to perfect the work. The subject can, of course, only be considered in a very general way, as each case in point furnishes conditions of its own that must be worked out for itself without reference to any formulated scheme.

The changes possible in any given building depend upon so many different conditions and are so limited by local building regulations, structural considerations and cost that it often seems impracticable to undertake any change, even in studios that have long since ceased to conform to the ordinary reguirements of convenience or comfort. In such cases as these, where extensive alterations cannot be undertaken, it is usually better to be content with a thorough renovation and freshening up of hangings, decorations, etc., meanwhile keeping a sharp lookout for a new location, than to expend time, energy and money upon alterations that will only alter without materially improving the conditions.

In cases where, for local reasons, it is unwise to give up the old studio, and where alterations and remodelling are possible, a great deal of careful thought and study should be devoted to a decision as to just what shall be chiefly aimed at in the reconstruction. Is the main object of the change to be the securing of increased space under the skylight and in the workrooms, or to the enlargement of the reception- and dressing-rooms? Many a man has found to his sorrow, after expenditure of time and money, that he has gone ahead too fast and has perhaps only half realized on his investment. Great difference of opinion exists as to whether or not a large and more or less elaborately furnished receptionroom is on the whole better than one or two small, cosey, home-like, modestly appointed rooms. We are strongly inclined to the latter arrangement, and for several reasons.

First, the prospective sitter, coming

into the studio for perhaps the first time. is not transplanted with too great a shock into an atmosphere and surroundings unfamiliar and frequently chilling to a large majority of every-day patrons. Again, a large and sumptuous apartment suggests at once to the ordinary mind a vision of considerable outlay for which the patrons of the studio must in the end be made to pay. The smaller rooms, if well arranged and quietly furnished, suggest an air of comfort and repose that is almost instantly appreciated and very often reflected on the faces of those who come within its influence. Variety of treatment in color and appointments adds charm to such an arrangement, and affords opportunity for occasional change and rearrangement without material cost.

The general trend of studio construction today is along these lines, and this treatment will be found practical in most cases where alterations are being made. One thing, however, that should never be lost sight of is the importance of planning every change with reference to economy of space and labor in the work rooms. Make every square foot of floor space yield up its utmost of convenience and value. So lay out the plan of rooms that the intending sitter naturally and easily passes from the reception-room to dressing-room and skylight, but what is of far more consequence, that the fillingroom, the developing-room, the printing, toning, washing, mounting, spotting and finishing-rooms are handy and convenient to each other. Let the work of the studio, so far as possible, be executed step by step along a progressive path that starts and ends again in the receptionroom. We may better say that starts and ends at the studio entrance, for this is the logical starting point and finality.

Whatever the attractions, conveniences and allurements to be found within the studio, see to it that every possible advantage is taken of the doorway show-case or display window at the entrance to the studio. It is this part of the establishment that first meets the eye of the passer-by, and it should offer him or her a pleasing air of refinement, good taste and interest which should at

once suggest the thought that work emanating from within is of good quality, of artistic composition, and such as appeals to the art-loving public in every way. Let the entrance arouse an interest that will attract the observer step by step within the studio; then it is "up to" the person in charge to take the order. Do not spend all the allotted amount of money within the studio itself, but see that the entrance has its own proportion in the changes and alterations that are to

improve the studio as a money-making investment.

In carrying on all these alterations it is well to stand in with the local newspapers and to see that the name of the studio is worked into the news columns just as often as possible. Every little incident connected with the progress of the building ought to be made the subject of a short local write-up, by which the name of the studio is constantly hammered into the attention of the public.

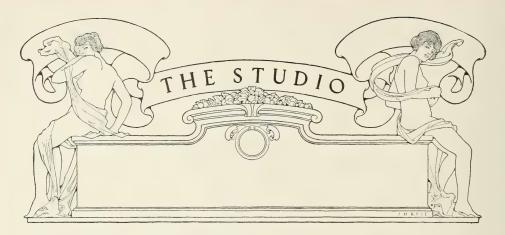
ORK thou for pleasure;

Paint or sing or carve

The thing thou lovest, though the body starve. Who works for glory misses oft the goal; Who works for money coins his very soul. Work for the work's sake, then, and it may be That these things shall be added unto thee.

-Kenyon Cox

True efficiency concerns itself with raising the quality rather than with lowering the price of the product.



PRACTICAL PAPERS ON STUDIO WORK AND METHODS

Photography for the Busy Man

Speaking to a man recently whom we knew in the past took a great interest in things photographic, we were somewhat surprised to hear that he had done no active photography for some considerable time. Upon pressing for the reason, we were told that his leisure was too limited to permit of any indulgence in his favorite hobby. This is, we believe, frequently the misconception under which a good many workers labor. There is certainly no limit as to the time we may profitably spend on our hobby, but we would point out that it is still possible to do a very considerable amount of photographic work even if our leisure does not amount to more than half an hour a day; and the week-end, even in war time, must surely be long enough to admit of a few daylight hours being snatched; while even if this is not the case it is possible indoors to dis-pense with daylight altogether by the simple plan of making our exposures by aid of the magnesium flash-lamp or even a few yards of ribbon.

That this does not give as good a result as daylight only remains for the individual worker to disprove, and we need hardly dwell upon the value—shall we say necessity?—of such a hobby in war time. The sole aim of this article is to point out that the mere fact that the operator is "busy"—and who is not?—need not in any way prevent his active following of his hobby, provided he is prepared to work upon more systematized lines than when he was possessed of abundant leisure.

Lack of time, like our old friend or bogey, expense, may be readily overcome, provided we go the right way to work and take an intelligent interest in our art.

Do Not Attempt the Impossible

In the first place, the busy man must bear in mind the old proverb. "A little done well is better than a lot done badly," and he must also bear in mind that to meet the changed conditions of the present time some modification (398)

of his ordinary photographic routine may be needed. In order to save time, the worker will probably decide to develop all his plates, roll or cut films in batches by the tank or stand systems. Though most popular, the tank method of development is not, to our mind, equal to the stand, and the latter offers the advantage that while the plates are slowly developing, the worker may leave them to themselves until the time required by the very dilute solution is complete.

Some of our most successful negatives were developed in batches of half a dozen in a porcelain developing trough, and without any attention, during dinner, and left nothing to be desired or give the slightest indication that they were not developed one by one with individual attention given to each. The stand system of development offers many advantages to the busy man, and is certainly economical as regards developing solution, since this is used very dilute. Fixing may be done in the trough or tank, if this is of metal, though unadvisable in the case of porcelain, and in this case a lead-lined fixing trough is a decided advantage. The task of washing negatives may be facilitated by the aid of an automatic washer; and should further time be grudged, a hypo eliminator may be employed, though there is generally some one in the house-hold who will undertake to attend to such a simple operation, if a little tact or diplomacy is exercised.

Printing

We now come to consider the choice of a printing process, and for those whose time is limited there is nothing to beat bromide paper. It has the advantages of being simple, quick, economical and yields results of great beauty; in fact, in the bromide process we find all the qualities that the most exacting could desire, and in the present case it is *par excellence*. The stand system of development advocated above has one great advantage to offer in conjunction with this, as negatives of a uniform character and density are the result, thus saving time in printing. If one

of the daylight printing processes is used, there is no need to finish the prints at the same time as they are removed after printing. In fact, P. O. P. or self-toning prints may be kept in a dark box or envelope under pressure for weeks or months before being toned and fixed, without any harm resulting, provided they are not allowed to come in contact with damp in any form.

The Value of a Hobby in War Time

We have endeavored to point out in the foregoing how those of limited leisure may carry on their photographic hobby with very little spare time, and this may be considerably extended if the worker is fortunate enough to secure the kindly coöperation of some interested member of his household to assist over the more lengthy and at the same time important operations, such as washings, which call for care rather than dexterity or technical skill. In this way a much wider scope will be open to the worker, and, however busy he may be, we would point out that all work and no play makes Jack a dullard; and though we do not intend to imply that the dignified art and craft of photography is in any sense play, the principle remains the same, and we venture to add that no single individual can be so pressed for time, even in this war of wars, that he cannot devote the small portion that we have shown is necessary for the production of good work. In our own case we know it to be the little bit of healthy relaxation that keeps one's sense of proportion well balanced and counteracts the obsession of the war.—Amateur Photographer.

Photographers' Removals

When for any reason the photographer is removing to other premises, it is noticeable that in most cases the autumn or winter is chosen, doubtless because what is commonly a slack period is considered a convenient time for such an undertaking. It may not, therefore, be unseasonable to offer a few practical warnings regarding certain pitfalls and dangers incidental to the removal of photographic apparatus.

Even with ordinary household furniture removals are to be dreaded, as not only a source of unspeakable discomfort, but as affording endless opportunities of injury to cherished possessions at the hands of hurried or careless workmen. That being so, it should be fairly obvious that the chances of damage are greatly multiplied where such fragile things as cameras, lenses, and similar photographic appliances are concerned. Yet we have known numerous instances of serious loss having been incurred through the treatment of expensive objectives and slenderly built apparatus with no greater care than falls in the ordinary course to a heavy brass bedstead or a massive dining-room table. In one case—an awful example of what to avoid -two valuable Dallmeyer objectives had been placed in a soap box, with merely a little loose newspaper around them, and the lid tied perfunctorily across with thin string. No label or other indication of unusual care being necessary was affixed, nor was any remark made to the workmen. The latter, possibly, had served an apprenticeship as railway porters, though the

precise method of the disaster was never really cleared up. Anyhow, one lens was completely shattered, while the other was so badly damaged that five pounds had to be expended to restore it to working order.

Such unfortunate happenings are easily avoided by the exercise of a little anticipatory common sense. Well ahead of removal day, a number of good, sound boxes of different sizes should be procured from the nearest oil-shop, giving them a thorough cleaning to remove any grease or dirt. The various cameras, lenses, etc., should be placed in these, taking care that they are well bedded on closely packed wads of paper, cloth, or felt, and having similar wads rammed in tightly all round, so that movement is impossible, however the box may be shaken. After placing a final layer of packing on top, the lid should be firmly nailed on, the box securely corded with rope, as used for trunks, and several "with care" labels conspicuously displayed outside.

Backgrounds should be carefully rolled up, wrapped round several times with stout paper, and finally inserted in water-proof coverings of oilcloth or similar material, made for the purpose on the principle of an umbrella cover. Several backgrounds may be firmly lashed together, if desired, and enclosed in a single cover. The foregoing may seem an unnecessary precaution, but such is not the case. An instance occurs to mind where a number of nearly new backgrounds were almost ruined through being carried outside on the top of a pantechnicon in pouring rain. An identical device is worth adoption for the protection of studio blinds in transit.

Such important items as the bulbs of mercury-vapor lamps, needless to say, require the most delicate attention. It is perhaps as well if the owner keep these under his personal supervision till safely housed. Electric globes, enlarging condensers, reversing prisms, thermometers, etc., call for painstaking packing; the same may be said of porcelain dishes, glass graduates, and measuring jugs. Unexposed plates, if such must be carried, should not only be secured against breakage, but against inquisitive handling. Quite recently a West of England photographer trusted the carriage of several score of unexposed plates to nothing more than the ordinary light-tight wooden plate-boxes with sliding lids, fastened with brass turn-catches. Without making any allegations, it may be remarked that every plate proved on exposure and development to be fogged.

A large collection of negatives often makes itself somewhat of a nuisance when moving, and it is a moot question whether it is always worth while transporting them. This is a matter that must be settled according to individual circumstances. Many of them may doubtless be "scrapped" with but a trifling and remote prospect of any loss accruing, but more recent negatives, and all having possibilities or likely to be of value as specimens, should certainly be kept. A good deal, of course, depends on the character of the business and the distance of the removal. It is generally worth while to notify past customers, in a courteous and nicely

got-up circular, that negatives of themselves or relatives are in store, and will be destroyed prior to removal unless a wish is expressed to the contrary. Besides advertising the new address, this usually brings in a remunerative proportion

of re-orders.

Perhaps the best method of packing negatives for removal is in the original cardboard plateboxes, ramming in paper or wool so that shaking is prevented. When a number of boxes have been prepared in this way, and tied tightly with string, these in turn are packed in larger wooden boxes, well wadded as before, nailed up, corded firmly, and labelled conspicuously, "Glass, with care." A breakage under such conditions is high improbable. The ordinary grooved negative boxes allow too much rattling to be quite

safe for removal purposes.

Specimens of all kinds should be well guarded against rain or damp. If this precaution is omitted, and it happens to be a wet day, much injury may result merely while placing in and taking out of the van. The mischief that can be done by a steady downpour, even in the brief passage from doorstep to tailboard and vice versa, must be seen to be believed. Chemicals and solutions should be tightly corked or stoppered and placed in wooden boxes with ample wadding or packing between them. Corrugated cardboard is frequently very useful in this connection. Clear indication should be placed outside the box as to which is the right way up, and the workmen's attention should be specially called to the contents. It is risky to attempt the transference of any large quantity of strong acids, such as sulphuric, nitric, or hydrochloric, with other goods.

Another hint that may be given is to take the handles off any machine that is operated by turning—burnishers and dry-mounting apparatus, for example—and to pack these separately out of the way. This prevents anyone experimenting with them, to their probable detriment. The rollers of burnishers should be closely tied up in cloth or wash leather. Loose screws, tripod screws, and small parts of every description, whatever they may belong to, should be put together in one receptacle, so that there may be no difficulty in finding them when required.

Regarding studio furniture little need be said, as it nowadays differs but slightly from the ordinary variety, and may be treated in practically the same way. When the photographer has his home on or adjoining the studio premises, and household goods have to be removed at the same time, it is strongly advisable to leave the photographic apparatus to the last. This means less likehood of other things being placed on the top of them, and also ensures that they will be taken out first.

It is more important than might be thought to employ only a removal firm of recognized local repute, who are specialists in that direction. On no account should anyone be engaged who "undertakes" removals as a side line, in addition to some other normal occupation. Such contractors are sometimes careful and trustworthy enough, but quite frequently their workmen are absolute amateurs at handling and transporting goods of any kind, and the

photographer will find his chances of damage considerably increased.

It is advisable to make an inventory of the goods, and to verify it at the earliest opportunity, as the smaller articles have a knack of getting mislaid or lost, and these are often the most valuable. An instance occurs to mind where an anastigmat in a leather case was discovered in the sacking at the bottom of the van some weeks after the removal, and brought back—wonderfully enough, quite uninjured—by one of the workmen. In another case, a box containing a set of optically worked light-filters was inadvertently left behind at the old premises, and ultimately found in the dust bin.

As a concluding hint, it may be stated that it is better policy, where photographic goods are concerned, to engage the contractor by the hour rather than by the "job." It may, and most likely will, cost a trifle more, but the work will be done in a more careful and less hurried fashion, and with far less likelihood of injury or

loss.—British Journal of Photography.

Living Your Business

WE hear, now and then, of business men who wreck their health by worrying over their business outside of business hours, and many very successful financiers have given us their advice to leave business at the office and preserve the hours of absence from work for recreation and mental rest. If we confine this practice to worry and excessive mental strain, the advice is sound and should be followed. We have no argument against that.

But there is another side to the picture, and that is the possible tendency to devote a few hours a day to our work, and then think that we are straining our minds and taxing our strength unduly. We regret to say that whereas a very conscientious hard worker needs relaxation, there are a large number of men who do not know how to work hard. They think they are working hard, but by comparison with the leaders in industry or science, they are shirkers

and loafers.

We cannot too strongly voice our opposition to the habit of constantly worrying over our business, for we believe that worry does more to break down the constitution than hard work. But we believe that great good can come from thinking out our business problems outside of business hours and laying out plans and ideas that we may put into execution during the day. When we are free from the constant annoyances of the office and store, we are in a position to originate or plan, and we can often think out our greatest successes in a quiet corner or in that hour in bed before we fall asleep. Thinking of ideas and laying out plans is a decidedly different proposition from worrying, and we believe that one is just as good as the other is bad.

We have in mind one photographer who made a specialty of children pictures, and he was trying to explain how he had been so successful in catching children in the most charming poses and expressing so well action and vivacity. He stated that it had long been his custom to watch children at play, and he would sit and carefully figure out the moments when they would group themselves gracefully or when they were well lighted, and when he had what he thought was good he would press an imaginary bulb and hasten to get ready for another shot. He would spend hours in this fascinating pastime, and during those hours he was living his business and practicing and planning. When he applied these methods to his business he found that he had acquired additional skill in determining just the moment to press the bulb and get the results that the opportunity presented in its most

inviting form.

Another photographer told us of his habit of watching ladies wherever he went, at the theater, at church, on the street, in action or at rest, and he tried to figure out how he would pose and place each lady he watched. In case he discovered a smile or a tilt of the head that impressed him as being characteristic and pleasing, he would plan how he could duplicate that natural pose and expression with a sitter before his camera. He was living his business and giving to it time outside of his business hours, not in a way to worry or hamper his ability, but in a way to add to his zest and interest in the work and to increase his ability at the studio. Frequently ladies would come to him, and he would recognize them as people that he had watched at some time or other, and he would remember some plan he had formed of how he would photograph her her best. He was prepared in advance, and knowing what he wanted to get, it became merely a matter of working to induce her to assume the pose or expression he wanted.

Men who have attained great prominence in art, science or business have always given thought to their work outside of business hours, and we believe that in the photographic profession the men who have lived their business away from the studio have been the ones who are at the forefront in originality and ability.—

Trade News.

"Fancy" Lighting

The method of lighting, good enough in itself and only suffering from incorrect nomenclature, which was so popular a few years ago under the name of Rembrandt seems to have fallen into disfavor with most photographers, yet those who still use it on suitable models find the results are usually appreciated by the sitters, and especially by those who are very sensitive about their appearance. One of the advantages of this style is that it cannot in any way be compared with the idea of himself which the sitter has formed by a diligent study of the mirror, and another is that being an unfamiliar lighting friends who are called in to help to worry the

poor photographer are more likely to be attracted by the pictorial qualities of the portrait than by its mere likeness as judged from their point of view. It is essential that a full scale of tones be preserved, and we would caution those who are not past masters in the management of light against one variety of this style which did much to cause its disuse. In this the whole of the direct light was kept behind the sitter, giving a narrow line of light around the profile. A rather strong reflected light was thrown upon the shadow side of the face, resulting in a flat effect, which was rendered worse by the position of the reflector, which usually was placed at such an angle that the light was thrown upward, destroying all the natural shadows of the face. It is not necessary, nor even desirable, to take absolute profiles of most sitters, as many faces have other and more pleasing contours, and it is easier to get plasticity with a slight turn of the head toward the camera. A common error is to use too concentrated a light under the impression that vigor is necessary. Hard shadows and rough skin texture are so caused, and much retouching is necessitated, whereas if the main light is subdued by a translucent screen a much softer picture is obtained without increase of exposure. It is absolutely essential to screen or hood the lens so that no direct light strikes it. If the image of the window or arc lamp falls within the camera the diffused light will inevitably cause fog. For the same reason it is necessary that the surfaces of the lens should be absolutely free from dust or cloudiness. Full exposure should be given so that no forcing in development is necessary; if there is any clear glass it may be assumed that the exposure has been too short. If the negative appears at all hard it may be reduced with persulphate; ferricyanide will make it worse.

"Fancy" effects are even more easily obtained with the electric light than with daylight, but the lamp must be well screened off from the camera. We have seen a small background with a square hole cut in it placed between the lens and sitter, so that the head is, so to speak, framed by the opening. This also gives a better idea of what the finished result will be than when all the surroundings are visible to the operator. Even more than in ordinary lighting is it necessary to judge the negative by the print it gives. We have seen muddy, thick-looking plates, which the inexperienced operator would destroy, which were capable of giving the finest possible results. Mounting is, of course, a matter of taste, but as a general rule the rough papers now so popular will be found very suitable. Light paste-downs or white margins should be avoided, as they detract from the value of the small area of high light in the picture.—British Journal of Photog-

raphv.



War Work for You

Who will help to furnish relaxation for our trench-tired soldiers in France? Who will give them a sight of home scenes that will bring joy to their hearts?

You can have a real part in supplying the brand of recreation and relaxation that every man who has seen a bit of real fighting

appreciates.

The National War Work Council of the Y. M. C. A. asks every owner of lantern slides, who will, to box up the most interesting slides in his or her collection and send them at once, prepaid, to Mr. J. A. Rawson, Jr., National War Work Council, Y. M. C. A., 347 Madison Avenue, New York City, N. Y.

No one knows better than these Y. M. C. A. workers what the men in France want and should have. And when they ask for something that you can give, you can be sure it is something our

boys need and should have.

Every Y. M. C. A. hut in France, and we know they go right up to the front lines, offers every available means of amusement possible for the soldiers within its range. And it has been found that while the men like to sing and smoke and eat, the big hit is made when they can feast their eyes on a bit of their home land. And every familiar American scene, from the Statue of Liberty to the Golden Gate, is home to our soldiers.

This isn't charity—it is plain duty. If you have in mind to go over your slides and pick out the culls, don't do it. Stop and think what our soldiers in France are doing for you—then decide whether or not they are entitled to the best you can given them. They are, without

question.

Pick the cream of your lantern slide collection and send it along. And if you haven't full sets, make them. Give every slide a title and, when possible, send a series that can be made into a

picture story.

Authors, editors, lecturers, travelers, and newspaper correspondents have volunteered to put the slides in order, index them and make them into travelogues or picture stories that will make them of greatest interest to men in the hospitals, training camps, billets just behind the lines or in the trench dugouts.

Practically every Y. M. C. A. hut or tent or dugout has its lantern and can show slides when no other form of entertainment is possible.

Remember that the slides you send are food for the minds of as fine a lot of soldiers as ever manned a gun. Their nerves are shattered, their bodies weary after long hours of trench duty, and they must relax. Nothing sets them right so quickly, fills them with the fighting spirit and makes them so fit and eager as picture glimpses of home.

Help our boys pack up their troubles—pack up your slides—the best of them—and send them to the address above. A million or more of our boys will enjoy them and will bless you. Enclose a note with each shipment of slides, stating by whom they are sent, and do it now. The sooner the slides are received the more good they will do.

The Second International Photographic Salon, 1919

The Second International Photographic Salon, under the auspices of the Camera Pictorialists of Los Angeles, will he held in the Gallery of Fine and Applied Arts, Museum of History, Science and Art, Exposition Park, Los Angeles, California, U. S. A., from January 3 to 31, 1919. The exhibition will be open daily from 10 A.M. to 4 P.M. (except Wednesday afternoons) and on Sundays from 2 P.M. to 5 P.M.

The aim of the Salon is to exhibit only that class of work in pictorial photography in which there is distinct evidence of personal artistic

feeling and sentiment.

All work submitted to the jury of selection will be carefully and impartially considered, but no picture will be eligible that has been previously

exhibited in Los Angeles.

All pictorialists are cordially invited to contribute. Address all correspondence and entrance fee to Ernest Williams, Secretary, Room 31, Walker Auditorium, Los Angeles, California, U. S. A.

"Photomicrography, an Introduction to Photography with the Microscope"

The wide use of photographic materials in connection with microscopy for pathological, medical and metallurgical purposes makes a

demand for a booklet dealing with the photo-

graphic problems involved in photomicrography.
For some years Messrs Wratten & Wainwright specialized on the preparation of plates and color filters for use in photomicrography and issued a series of booklets dealing with this subject, of which one edition has been published in the United States. This present lished in the United States. This present booklet, however, represents a complete revision of those previously published, in view of the methods generally employed in this country, and is offered in the hope that it will be of use to those who are interested in photography through the microscope.

This fourth edition is considerably revised and up to date. Copies can be obtained from the Eastman Kodak Co., Rochester, N. Y., with remittance of 15 cents for mailing changes.

The Brooklyn Institute of Arts and Sciences, Department of Photography, Academy of Music Building

Proposed Events of the Department of Photography Season of 1918-1919

Loan Exhibition of Prints

Monday, October 28; Monday, December 2; Monday, January 6, 1919; Monday, February 10, Monday, March 17; Monday, April 28. Saturday, April 26, 1919, Twenty-ninth Annual Exhibition.

Demonstrations

Friday, October 11; Friday, November 1; Friday, November 22; Friday, December 13; Friday, January 3, 1919; Friday, January 24; Friday, February 14; Friday, March 7; Friday, March 28; Friday, April 18.

Lectures on Photography and Criticism

December, 1918; January, 1919; and February and March.

Classes

(Advance Classes)

Instruction in Art Photography. October 3 to April 3, first Thursday evening in each month and seven Saturday afternoons at studio work under the instruction of Clarence H. White.

Instruction in Rudiments of Photography

October 1 to April 22, on Tuesday evenings: Beginner's Class, first and third Tuesdays. Advanced Class, second and Fourth Tuesdays. Also four afternoons in field work and ten demonstrations by William H. Zerbe.

The London Salon of Photography

THE London Salon of Photography will hold their Exhibition as usual this year, opening on September 14 and closing October 12. The conditions of entry remain the same as last year. The sending-in day is September 3 and entry forms may be had on application to the Hon. Secretary, London Salon of Photography, 5a, Pall Mall East, London, S. W. 1.

Photographers' Union

WE are advised that workers in all classes of news, commercial and photographic fields of Seattle, Wash., have organized the Seattle Photographers' Union. The union was organized with seventy-five members and has a charter from the American Federation of Labor.



RAU ART STUDIO PHILADELPHIA, PA.

A New Fixing Bath

THE following shortstop and fixing bath, recommended as a substitute for the hypoacetic fixing bath which everybody has been using, has been found by us to work correctly for those who are unable to secure acetic acid.

Fixing Bath

Recommended as a substitute for the hypoacetic acid fixing bath for development papers. Important. The use of a shortstop between developing and fixing of the prints is absolutely necessary, and a bath should be prepared as follows:

> Shortstop Formula Water . 32 oz. $\frac{1}{2}$ OZ.

Rinse the prints in this bath immediately after developing and before fixing. Fix the prints in a solution prepared as follows:

> Water Нуро.

Fix	ing	Ba	ith	For	mul	a	
							60 oz.

When dissolved, add the following hardener:

 Water
 4 oz.

 Sodium bisulphite
 2 oz.

 Powdered alum
 1 oz.

 —Portrait.

Instruction in Photography

October 1, 1918, to April 22, 1919

The department of photography of the Brooklyn Institute of Arts and Sciences begs to announce that it has again secured the services of Mr. William H. Zerbe to conduct a course in photography.

These courses given by Mr. Zerbe for the past seven years have been the means of making a large number of struggling amateur photographers proficient in the art, both technically

and artistically.

As heretofore there will be a class for beginners and one for more advanced workers. Students who have taken the courses in previous years are enthusiastic over Mr. Zerbe's painstaking methods of instruction. Mr. Zerbe always brings himself down to the level of the students, refraining from using technical terms, so that one cannot but help to advance in his photographic work.

Classes meet on each Tuesday evening at 7.45. The tuition fee for members of the Institute is \$11 and \$15 for persons not members.

Write for prospectus giving full particulars. Address the Brooklyn Institute of Arts and Sciences, Academy of Music, Brooklyn, New York, or Mr. George H. Dean, 27 Madison Avenue, New York City.

Advanced Class in Instruction in Art Photography

Recognizing the broadening influence of astistic photography in portraiture, magazine illustration, and as a medium of art expression, the department of photography of the Brooklyn Institute of Arts and Sciences has again secured the coöperation of Mr. Clarence H. White, of Columbia University.

This course will consist of fourteen sessions, beginning October 3, 1918, and ending April 3, 1919. The class will meet on the first Thursday evening in each month, and there will be seven

Saturday afternoons at studio work.

Anyone interested in photography, living near New York and Brooklyn, will be well repaid by attending this special course, which is open to beginners as well as advanced workers. It is an unusual opportunity for all photographers.

The cost of tuition for members of the Institute is \$11 and \$15 for all other persons.

Write for prospectus giving full particulars. Address the Brooklyn Institute of Arts and Sciences, Academy of Music, Brooklyn, New York, or Mr. Clarence H. White, 122 East 17 Street, New York City.

A Help for Photographers' Dependents

W. S. LIVELY, president of the Southern School of Photography, McMinnville, Tenn., will run a two weeks' intensive training class for wives of photographers. He writes us:

"The draft and enlistment of many professional photographers into the Government service, leaving their studios in charge of wives, with but little experience under the light and in the dark room, suggested the thought that a condensed training of two weeks here would help them over a serious difficulty, and that we could do our bit for the noble boys of our profession in helping them. So, with the approval of our P. A. of A. President, Ryland Phillips, and General Secretary, Charles Columbus, we will set apart the first and second weeks in October and give an intensive training, condensing a three months' program under the light and in the dark room within the short time of two weeks, which will be free.

"This has heen announced at the Kansas City, Missouri Valley and the Ohio-Michigan Convention at Cedar Point. All the journals represented at these meetings gladly give use of their pages to give this publicity. We feel confident that you will also gladly extend this offer through each publication between now

and October 1.

"Information promptly given to any who write. Accommodations can be had very reasonably."

Camera Dead-black

The dead-black varnish generally employed by camera manufacturers for blacking the interiors of cameras to prevent reflection of light is made by mixing lampblack with a solution of celluloid. This is superior to the usual mixture, of which the basis is shellac varnish, and the composition has for a long time been regarded as a trade secret. It is, however, quite easily prepared, the proportions of the ingredients being best found by trial. Spoiled roll film negatives, cleared from the gelatin, will furnish the celluloid, which only needs to be shredded finely, dissolved to a syrup in amyl acetate, and thinned down with acetone. The lampblack is afterward stirred in and thoroughly mixed.

Kite Photography

Editor Photographic Journal of America:

I enclose prints made with my instruments in which one of the chief component parts is a No. 3 fixed-focus box carrying a meniscus lens and a rotary shutter. I will tell you how I developed the instrument I am now offering for

use on the battle front.

Fifteen years ago, when W. A. Eddy was experimenting at Bayonne, N. J., I was advertising by means of kites and banners in New York, and became acquainted with another kite-man, named Stephens, who showed me a little tin box containing a single pulley that he used on his kite-string, carrying it upward by a paper parachute until it reached a knot that operated a slide on the box to release the hook that held the parachute, to which a small bundle of papers or handbills could be attached, so as to drop them over a crowd at race tracks, fair grounds, etc. This gave me the idea. I did not want to lose my parachute every time, so I experimented at my home, then on Sixth Avenue, until I had perfected a messenger, somewhat similar in form to a

butterfly, that would carry my bundles up, drop them, fold its wings together, and return to me.

I did not patent this because I realized that there were only about a dozen persons in the country who could be classed as professional kite-fliers who would have use for it. Its principles and construction were so simple that any of us seeing it could make his own. In testing it out one day I raised my kites about 1000 feet from the roof of the building where I lived and sent my messenger up with some scraps of newspaper, sending my boy to watch and follow to where they went, and thus let me judge of the effectiveness of the instrument for broadcast distribution of notices. My boy returned after nightfall, bringing a few pieces he had picked up near St. John's College, in Fordham, N. Y.



KITE PHOTOGRAPHY BY S. PARKS

I used this instrument many times afterward at many places, especially in Detroit, Mich., where I frequently flew my kites from the Chamber of Commerce building, and where I had the fortune to raise what I believe was the largest-ever kite-banner (800 square feet painted with seven-foot letters) for Morgan and Wright over automobile races at the State Fair Grounds.

Moving into the Southwest, I had given up the kite game until the campaign of 1916, when I picked it up again for local campaign work, but did not reconstruct my messenger until the United States officially recognized that it was in the war and required further mastery of the air. Knowing that he who can master the air will have control of all that is below him for military strategy, I made new messengers until I had one that would work nicely and carry a box camera operating a shutter instead of turning it loose.

I have experimented with cameras of different sizes and kinds, adapting my instruments to each,

to discover the proper balance, angle, etc., until I decided that the $3\frac{1}{4} \times 4\frac{1}{4}$ box was the most adaptable of ready-made ones for this use, and this is the size I took with me to exhibit to the military authorities and to photograph the trenches in Camp Cody, N. M. I have been steadily corresponding with Signal Corps Headquarters, but have not yet obtained any recognition, although I am assured the French are now using kites requiring five men to manage, and raise a cumbersome camera, using a time fuse and requiring to be hauled down to secure the plate or film. I can and have often gone out alone, raised my kite, sent up my messenger, and had it returned to me with the photo secured within twenty minutes. The only objection yet offered has been that a taut wire (for wire would probably be used in all military work) would be fatal to an aëroplane—the fallacy of which is at once apparent when the normal altitude of 500 to 800 feet is compared to that attained and required for safe maneuvering in planes; besides the fact that the kite is always under control, can be instantly cut lose if necessary, the loss being but a couple of dollars, or could be hauled down to enable the aëroplane to hover low, start or land.

America must win this war. Her emblem is the eagle, and her greatest and best field is the air. Photography is one of the most important helps to her in this field, but a camera that can be used from an aëroplane must be a costly one. A few of us old kite-men could teach the infantry squads to make and manage kites, and the government could give every squad one or two of my instruments at a cost of less than five dollars each, if made by this government in its own factories.

My method of raising and operating a camera is new and I believe patentable. There is nothing similar, although aërial photography has been experimented with for years. I have not yet tried to patent it, for personal reasons, though I would do so if I could assign a half interest to this government or I would give a half to one who would patent, provided he agreed with me to each transfer a half interest to the government. has been called to the attention of the Canadian government, but again, for personal reasons, if it is not adopted for use by an English-speaking government before the close of the present war, I shall make public and free all details of my construction, so that every photographer may make and operate his own instrument for local bird'seye views, postcards, and souvenirs.

There is no doubt that my instrument can be improved for R. R., anastigmat and telephoto lenses, but I shall spend little more on it for my own use—it is good enough.

S. Parks.

The David Stern Co.'s New Catalogue

From the David Stern Co., Chicago, Ill., we have received their new large Catalogue, No. 102, which includes a large line of standard supplies. This enterprising firm has instituted a free service department to answer inquiries of any nature pertaining to photographic matters. The Company also offers a guarantee on every sale. This catalogue is well worth writing for.

Profit in Printing

The British photographers and dealers, says *Photo News*, are now getting 96 cents for developing and printing a roll of six exposures III A film. All other sizes in proportion. The cost of material is less in England than it is in America. Why is it the American photographers do not want to make as much profit as those in England?

The New England Convention

As we go to press the New England Convention is in session. This convention promises to be of usual interest. We will have a full report in our October issue.

North Central Photographers' Association Convention

This convention, comprising the States of Iowa, Minnesota, North and South Dakota, Montana and territory adjoining, not represented by any other amalgamation, will be held September 18, 19, 20, 1918, at St. Paul, Minn.

Program Features that Can be Given Now

1. Banquet and ice breaker.

2. Capt. H. A. Wilsdoon, of the Royal Flying Corps, with large display, sent by P. A. of A. through War Department.

3. Large display of photographs by photog-

raphers.

4. The Association will buy up to ten best photographs exhibited at ten dollars each and engraved certificates, open to the world.

5. How to create business with honor and

credit to the profession.

6. How to hold business created from the stand-point of professional ladies and gentlemen.

The executive board is determined to launch a program of efficiency that can be followed up and added to each year by the best talent obtainable in a systematic manner, for the betterment of professional photography and those interested therein.

Executive Board: President, S. M. Judd, Minneapolis, Minn.; Vice-President, H. H. Egbert, Atlantic, Ia.; Secretary, John R. Snow, Mankato, Minn.; Treasurer, H. E. Voiland, Sioux City, Ia.

Vice-Presidents: E. B. McCracken, Fargo, N. Dak.; Mrs. Christine Worthington, Aberdeen,

S. Dak.; P. A. Brainerd, Havre, Mont.

A Very Good Reducer

A REDUCER that is excellent for harsh negatives is made up as follows:

Place the negative in this solution until sufficiently reduced, then rinse well and dry.

New Rapid Panchromatic Plates

A MOST notable advance in the manufacture of color-sensitive plates is embodied in a new and improved grade of panchromatic plate which has just been put upon the market by Messrs. Ilford, Ltd., of England. The new plate, says the British Journal, represents an advance in two respects, namely, speed and evenness of color-sensitiveness throughout the spectrum. We have made exposures in the spectrograph and through a set of three-color filters, and both forms of test have shown the remarkable success which has attended the manufacturers' aim at securing a much higher degree of perfection in the two qualities which, in conjunction with range of gradation, etc., determine the value of a panchromatic plate. Exposed in the spectrum without any screen the plate records a band of density from the ultraviolet to the red end of the visible spectrum, practically even throughout and unmarked by gaps. Exposed through a set of the three-color filters ordinarily employed in the making of color-sensation negatives for photoengraving the plate yielded a negative exhibiting a slight degree of overlap between the green and the blue, practically continuous from the green to the red and this with a ratio of exposures in the proportion of: red 4, green 5 and blue 4. These were the ratios indicated on the slip enclosed with the box of plates, and their adoption showed that they correctly represent the performance of the particular batch. At the same time comparison with the previous grade of the Ilford panchromatic showed that the actual exposures required by the new plate were from one-third to one-quarter.

It is therefore evident from the results of these tests that the makers have united in a plate of otherwise excellent quality a very much greater general speed and individual color-sensitiveness which roughly may be taken to be the same throughout the spectrum, or perhaps we should say to differ from this latter only in requiring a slightly greater degree of exposure in the green. Thus it is not surprising to find that, employed in the camera without any compensating lightfilter, the plates afford a degree of color-correction which is sufficient for a very large proportion of the subjects ordinarily calling for a screened plate. The pictoralist will value this quality, and all the more in that the general speed of the plate is sufficient for shutter exposures with a hand camera even when a light-filter is used. For it must be remembered that in the case of a plate possessing such evenness of color-sensitiveness the prolongation of exposure by a yellow screen is much less than in the case of a plate the range of color-sensitiveness of which is more restricted. On all these accounts it is not too much to pronounce the new Ilford plate as the most perfect example of highly sensitive panchromatic material which can be obtained. It will doubtless find numerous applications, not only in the vitally important work of aërial photography but for the industrial purposes of three-color photoengraving and in the scientific fields of spectro-

graphy.



WORKROOM

ONTAINING THE LATEST PROCESSES, FORMULAE AND APPLIANCES NEEDFUL IN THE ART OF PHOTOGRAPHY FOR THE OPERATOR & WORKER

TO CONSTRUCT A DARK ROOM
GOOD MOUNTANTS FOR PHOTOGRAPHS
TRANSFERRING COLLODION AND GELATIN POSITIVES TO PATENT
LEATHER
NOVEL METHOD OF VARNISHING
PASTE MOUNTING OF PRINTS IN QUANTITIES
THE CARE OF LENSES

THE CARE OF LENSES
REDUCTION OF BROMIDE PRINTS
URANIUM TONING
FIXING HANDWORK
WASHING UNDER THE TAP

PYRO
A NON-COCKLING MOUNTANT
RESTORING TARNISHED OR DISCOLORED DAGUERREOTYPES
CARBON TRANSPARENCIES
GASLIGHT EMULSIONS FOR PLATES AND PAPER
PHOTOCHEMICAL ACTIVITY OF ULTRA-VIOLET LIGHT
PHOTOGRAPHY AND TULLE

MAKING AND KEEPING DEVELOPERS
THE TROPICAL DEVELOPMENT OF PLATES AND FILMS
WASHING NEGATIVES IN CAMP



is satisfactory.

THE WORKROOM

By the Head Operator



To Construct a Dark Room

Is wealth more important than health? It would seem so, for we see little in our magazines about the construction of dark rooms and much about the building of studios; and yet we are often told that the former are unsanitary, ill-ventilated, and badly planned. If this is really so, it must be that the first photographer looked for a "dark hole," ready made, instead of making it, and so found this way to some small closet or to the coal shed. I have twice fitted up a developing room, and will just describe the one I have at present, in the hope that it may prove useful to some worker who has not got one which

The room which I use is ten feet long by six broad, with the door entering at one end and a large window in the opposite end. Until twelve months ago I used this window to supply light. The top half was kept permanently blocked with a frame of wood covered with sheets of brown paper. The lower half was fitted with a frame containing a single thickness of yellow cloth; this was closely fitted so that not a single gleam of white light could work through or around the frame. I had three other frames, one yellow and two deep red, and by standing one or more of these in front of my fixed yellow screen I made the room safe for development. With the yellow screen only I could mix solutions, etc., as comfortably as by daylight, and, of course, I used it whenever developing paper. A year ago I changed to electric light, using lamps of ruby glass, which I got from Gatchel. One of these is hanging over my developing sink, rigged with a weight and pulley, so that I can raise or lower it at will. Another hangs in the center of the room, just out of reach of my head, but I scarcely ever use it. Two white lights hang, one near the sink and the other near the door. To prevent mistake the lights are operated from a separate switchboard, and there are also turntaps close to the lamps. If I could not have

Lamps could be used with good ventilation; mine wasn't good, I fear. The ventilation I have now cost me \$40. As far as I can see, I could have done the work myself if I had had the "know how;" but it works all right now, and I am satisfied. There are two ventilators let into the window, near the top—the glass has been cut—and the lower part of the door is riddled with slots, with a hood over them inside, so that their light does not trouble me. I always supposed that ventilation went up hill, but the air comes in through the window and out through the door.

electric light I should certainly try for daylight rather than an oil lamp or gas. I have used both

The man told me it would do so in this building, and he has proved right.

But all this description of light and ventilation is keeping me from the fittings which more belong to dark-room work. Seven feet of one side of the room are taken up with the sink and the tables at each side of it. In the corner opposite the door is a table, its top three feet from the ground, twenty-four inches long by twenty inches broad. This table is quite level, for on it I stand my fixing baths. Underneath it there is a space for the hypo tank and three shelves, giving just enough room to allow porcelain fixing, etc., trays to be stored away. Next to this table comes the sink, its upper edge flush with the table. This sink in inside measurement is thirty-six inches by eighteen inches broad and four inches deep. It is made of inch wood, lined with lead. This lead has been well beaten down into the corners, and it is turned over the upper edges of the sink, being fastened on the outside with copper nails. I don't think that any sink can be as good as lead. It can easily be kept clean, and if a bottle or a negative is accidentally dropped into it there is a good chance that it will not break. The outlet to this sink goes through the wall, and has an open mouth over a grating outside. If it went to some enclosed drain it should be trapped. Over the sink I have two taps for cold water, with about four inches of rubber pipe on their ends. By squeezing this I can control the force of the water, and it prevents negatives accidentally getting scratched on the metal. I have the sink so big because I wanted to be on the safe side. The washing tank is permanently located at the end next the table already described, in front of the outlet and directly under one of the taps—the other tap is just one foot from the other end of the sink. The second table is like the first, but raised a little just to overlap the edge of the sink. It is grooved toward the sink, and very slightly tilted in the same direction. This table is used to stand bottles, measures, dishes, etc., on, and after they have been washed they are turned upside down on it to drain and dry. Developing itself is done over the sink. I have a skeleton of laths twenty-four by twenty inches. Being twenty inches broad, it rests firmly on the front and back edges of the sink, and to prevent it slipping forward the battens which hold it together are placed parallel with the length of the sink, and the two outer ones are placed to exactly fit inside the sink. By working on this, any liquid which slops over falls into the sink. Being loose, the frame can be lifted out whenever required. Over the fixing table is a twelve-inch shelf, useful to hold extra dishes, and above the grooved table are two shelves, the lower one holding bottles which are frequently

these, and had headaches.

used, and the upper one holding measures, funnels, etc. Under this table there is another shelf for extra bottles, etc., and under that the box which holds waste paper, etc. A big sponge, useful for mopping, hangs over the sink in a wire basket, and scrubbing and cleaning brushes lie in the sink.

On the opposite side of the room are five shelves, five feet long and twelve inches broad. On the top shelf all stock solutions are kept, and all things in use which are only wanted occasionally. As the space in the center of the room is only just over three feet broad—I find it quite broad enough—it is easy to reach any bottle which I require. On the second shelf I keep my stock of chemicals except hypo. The hypo keg I keep in the cellar—it is a dry cellar—and bring it into the dark room in the shape of a saturated solution. On the next shelf I keep my stock of plates, and there are two lower shelves which hold dishes, etc.

I find a room of this size quite sufficient, though it is too small for two. I could well spare the space under the window for shelves, and shelves could be run the whole length of the wall opposite the sink. I left the place under the window for some sort of summer refrigerator, but I have found that the water supply is cool in summer, and so I can manage by occasionally getting a pail of cracked ice in very bad weather.

In winter I have a small oil stove to boil water. With this I keep my solutions sufficiently warm, for the room is kept from extreme cold by other rooms or warm passages on every side except the window side.

I never keep lenses or any apparatus in the dark room. I have been warned against keeping plates there, but in a dry, ventilated place like

mine they take no harm.

Very likely some photographer who reads this may say: "Why, there is nothing in it; I feel so as I read the article through." But I know that my dark room is comfortable, and that in it I never get either earache or headache. I hope it is because there are very few fitments in the room that this description seems so empty, and that other photographers who have not comfortable dark rooms will look around to see if they, too, cannot improve things. All may not be so lucky as I am in water supply and equableness of heat, but all can at least have ventilation and sufficient non-actinic light.

Good Mountants for Photographs

The mounting of a photograph seems to be a matter of very small importance when compared with the skill and labor concerned in the production of the photograph itself. Many thousands of photographs of merit and excellence, only too many, that can never be produced again from the original negatives, have become ruined and almost obliterated for want of correct knowledge in the preparation of a good and reliable mountant. To many the only thing that is required is something that will stick, no matter whether it is gum, glue, or gelatin, all of which have been used for the mounting of photographs. If any of the above substances have been used for the mounting of silver prints by the extreme edges, it has

been found invariably that the print has changed color considerably, or has become very much faded in those parts where these mountants have been applied. The many impurities contained in common glue, the acid tendency of gum and the tendency to fungoid growth of gelatin when kept in a damp condition all contribute to and cause the fading of a photograph made with the organic salts of silver.

The materials that are employed at the present day for making a paste or mountant for photographs differ considerably according to the fancy of the photographer. A mountant that can at all times be depended upon, which will not change in its general qualities, and not subject to the various processes of fermentation when in either a wet, dry, or damp condition is still a desirable commodity for all kinds of photographic mount-

ing purposes.

There have been recommended from time to time compounds of gelatin with starch. The writer knew one photographer who used fish glue exclusively for his edge-mounted pictures. A compound of starch with sugar is also employed. Though some photographers employ ready prepared pastes, there are others who use a paste made of flour only, while the majority of photographers without doubt use a freshly prepared mountant of starch.

It is in this daily made starch paste where the main danger lies in producing the mountant that is likely to become sour through the setting up of acetone fermentation and cause the rapid fading of a silver print. The cause of this is because there is no hard-and-fast rule for preparing the paste. All pastes and mountants that are to be relied upon for photographic use *must* be thoroughly cooked and contain the addition of some reliable antiseptic, so as to prevent fermentation and not interfere with the adhesive qualities of the material used in the preparation.

A well-made paste of starch used in a fresh condition is fairly reliable; but it must be remembered that from the moment that such a paste has become set and cold, slowly but surely acetone fermentation begins, which after the first day continues rapidly, especially in hot weather, when if for no other reason, it must be thrown away

because of its offensive odor.

A well-cooked flour paste will keep in good working condition longer than a paste made with starch. For the benefit of those who wish to make a mountant that can be relied upon to possess all the desired qualities of a first-class paste, one that will not turn sour and possess keeping qualities and adhesive properties that will not change in a year, the following formula will meet the requirements:

Wheat flour .				$5\frac{1}{2}$ oz.
Common white	sta	rch		$1\frac{1}{2}$ oz.
Cold water .				20 oz.

Mix the above into a thin paste in the inner vessel of an oatmeal kettle, place some water in the outer vessel, and stand upon a gas stove to boil with the inner vessel adjusted.

Dissolve in *boiling* water (about three or four ounces by measure) sixty grains of salicylic acid, add this solution to the flour mixture in the kettle, stir the mixture with a clean wooden spoon and

continue the stirring without stopping until it begins to thicken. The stirring must be carried on for several minutes after the thickening has taken place, about five minutes is the right time. This is to enable the material to become cooked. If found to be too stiff for stirring, add about two ounces of boiling water and stir well until the admixture is complete, remove the kettle, lift the paste in the center by the wood strip, and add from eighteen to twenty drops of oil of cloves, thoroughly stirring the mixture once more so as to completely incorporate this essential oil. Then scrape the paste into a large clean basin and continue the operation until four or five batches have been made. Allow the paste to cool off, then squeeze it through cheese-cloth into a stoneware crock of the capacity of (say) one gallon and a half and cover with the stoneware lid as supplied with the crock, and the paste is now ready for use.

The working of this paste will be found to be extremely smooth, and in adhesive quality cannot be surpassed. In place of the starch, one ounce and a half of *white* dextrin may be used. Do not use the yellow variety, because this discolors the

paste

The above mountant will enable a print to be removed, in case of need, after a prolonged soaking in cold water and then in hot water for a few minutes.

This mountant is the one the writer has used for years for all kinds of photographs, whether in silver, platinum, or carbon, and also for bromide enlargements in size up to forty inches by seventy-two, and upon every kind of cardboard.

two, and upon every kind of cardboard.

As a preservative for paste to be used as a mountant for photographs salicylic acid has proved to be one of the best. If this preservative is used in combination with starch, it causes the paste to become pink, and shows in a decided manner should a little of it ooze at the edges of

the print.

The next best mountant is made by the addition of from thirty to forty drops of a 40 per cent. solution of formaldehyde to every two ounces of starch where the starch has been mixed to a stiff consistency in cold water. Then by adding some boiling water and stirring well, the starch thickens, and continue the stirring until thorough incorporation is assured, and when cooled down squeeze through cheese-cloth. This will give a good quality mountant that will not decompose, but if a print has to be removed from a mount where this paste has been used, it will be more difficult than with the paste already described. When this starch paste becomes set it is as clear as gelatin, and becomes almost insoluble in water.

Another mountant can be made by using wheat flour alone, as follows:

Wheat flour 4 oz. Water 10 oz.

Dissolve in another ten ounces of boiling water fifteen grains of salicylic acid; add this to the flour mixture, and boil in the oatmeal kettle as already described. When cooling down, add twenty drops oil of cloves, mix well and squeeze through cheese-cloth. Many years' use of the No. 1 formula has proved it to answer every requirement the photographer can devise.

Transferring Collodion and Gelatin Positives to Patent Leather

To transfer a collodion positive from a glass plate to any other material, such as patent leather or a well-glazed black oilcloth, is not at all a difficult matter, neither is it a long or expensive process, the result obtained being superior in quality compared with a similar portrait upon glass, backed with either black velvet or black varnish. Transfer can also be made upon mica or transparent celluloid. When it is not possible to secure a collodion positive, an ordinary gelatin dry plate may be employed and the negative image obtained upon this kind of plate can be transformed into a positive, which is easily stripped and transferred to any of the above materials. The advantage to be secured by this method of producing a photograph lies in the fact that there is a quality about these transferred pictures that is not produced by other means. It will be observed that such prints present the surface that had hitherto been in contact with the glass plate. This reversal of the film is necessary to present a portrait in the correct position. It is this surface that gives the peculiar property these pictures possess. In the transfer of a collodion positive the use of a substratum is not necessary to cause the film to adhere to the surface of the patent leather or oilcloth, there is just sufficient tackiness in the surface to permit of perfect adhesion. A necessary point to be attended to is to be sure that a collodion is used that is tough and horny, otherwise the film will not be so easily removed from its glass support. The bromo-iodized collodion used in the making of ferrotypes (tintypes) will answer the purpose perfectly, because this kind of bromo-iodized collodion must of necessity be tough in quality to enable it to adhere firmly to the japanned surface of the iron plate. Having procured a collodion possessing the above quality proceed in the usual way to make a positive upon a piece of well-cleaned glass plate in just the same way as for producing a ferrotype; of course, the nitrate of silver bath must be in good working condition, capable of giving clean, clear shadows. The developer may be that made with protosulphate of iron as used in developing the ferrotype, or it may be made of the proto-nitrate of iron. In the latter case the image will possess more contrast, and the deposit will be of an intense silver white, possessing the appearance more of an electrically deposited image than one produced by chemical development; this latter method of development will not affect the skinlike quality of the collodion. The development must not be carried too far; if stopped at the right moment, then washed and fixed with a solution of cyanide of potassium, then well washed again, it will produce just the kind of collodion positive for transferring. Allow the plate to dry, then cut a piece of patent leather the size required, make up the following mixture:

Photographic alcohol . . . 1 oz. C. P. nitric acid (38 degrees).

ten drops, *not more*, or the film will become injured. Have ready at hand an ordinary printing frame, say 4 x 5, with a clean 4 x 5 piece of glass therein; pour a few drops of the above mixture upon the surface of the leather, then wipe

it carefully with a tuft of absorbent cotton until the liquid flows freely, and to clean the surface see that no pieces of cotton fiber adhere. Now pour some of the same liquid over the glass positive, place the piece of patent leather down very carefully upon the wetted film by holding the leather like the letter U, bring the ends down upon the plate without slipping, place the positive and leather in the printing frame upon the glass plate, and place upon the leather a piece of blotting paper; insert the back of the frame and adjust the spring without slipping, turn the frame over, when it will be found (if the operation has been performed right) that the leather is in perfect contact with the positive image. The frame may now be stood aside for about one hour or for an hour and a half to allow the surface to become quite dry, when the frame may be opened. Upon lifting one corner of the leather with the blade of a pen knife it will be found that the positive photograph has been entirely removed from its glass support and firmly adheres to the leather. It is advisable when the patent leather has been placed upon the positive to examine the plate from the front to ascertain whether there are any air bubbles or not; if there are any, the leather must be carefully removed and a further quantity of the alcohol and nitric acid mixture poured upon both the positive and the leather, then replaced and adjusted in the printing frame. These air bubbles rarely occur, but if they do they must be got rid of by the above means.

The surface of the positive must not be brushed or wiped, if it is it will be ruined and a second positive would have to be made. The whole operation is extremely simple and one need not fear failure if only ordinary care is exercised in the operation, and the formula given attended to as to the proportion of ingredients. There will be no need to varnish the film; it will be found that the surface presents a high gloss, and the collodion film will be found to adhere very firmly to the surface of the leather.

In using black glazed oilcloth the operation is just the same, only the oilcloth must have a smooth surface, not mottled, because this kind of oilcloth cannot be pressed sufficiently into contact with the surface of the positive. Although air bubbles may not be formed, it would be found upon removing the print that it would present a considerable number of small shiny spots where the collodion film had not come into perfect contact with the surface of the oil-cloth. The picture would then be spoiled. If a plate of mica is used, it should first of all be well cleaned and coated with a film of plain collodion, or it may be coated with the same bromoiodized collodion that was used to make the positive, and placed into a tray of clean water before the film dries, so as to wash out the iodizing It must be allowed to dry, and wetted with the alcoholic mixture in the same way as the patent leather, the back of the mica being brushed over with asphaltum varnish, after which it is ready for trimming and finished as required.

To transfer a positive made upon a gelatin plate the operation is very different. In this case the film must be stripped from the plate and placed upon the surface of the leather, or celluloid, or mica, as the case may be.

To produce a gelatin positive proceed in the following manner: Procure some gelatin plates that work somewhat slow, those plates that possess the general qualities of a lantern plate are best suited, and the developing may be carried out with a metol-hydroquinone developer slightly restrained with a 10 per cent. solution of bromide of potassium. The object of this is to keep the shadows clear. When the exposure has been made, say, for a portrait, and developed so as to cause no fogging in the shadows, the plate must be thoroughly fixed, washed and then placed into a bath of chrome alum, one ounce of chrome alum to ten ounces of water. As soon as the crystals are dissolved the solution must be filtered and the plate containing the image placed therein. The picture upon the plate will present itself as a weak negative; it will not matter whether the plate has been allowed to dry or not; the chrome alum bath is indispensable, the plate must remain in this bath for ten minutes, then be well washed and dried. As soon as it is dry it must be transformed into a positive, which is accomplished by treating the image in the following solution:

Bromide of potassium		60 gr.
Bichloride of mercury		60 gr.
Distilled water		10 oz.

Heat this in a clean glass flask until the salts are dissolved, allow it to become quite cold, then add ten ounces more of distilled water and filter through absorbent cotton. Place the plate into this solution. In a very short time it will be seen that the image whitens up considerably. An addition of a few drops of citric acid solution may be added in the first place:

Citric acid	1			120 gr.
Water .				3 oz.

This will aid in keeping the shadows clear. As soon as the image presents a uniform white appearance, seen from the back of the plate it must be removed and thoroughly well washed for fifteen minutes, then stood aside to dry again. The mercury whitening solution may be returned to the stock bottle for use over and over again. As soon as the plate has become quite dry the film is in a condition for stripping. The following solutions must be made up and kept ready for use in separate bottles:

Fluoride of	so	diur	n	81		120 gr.
Water .						8 oz.
Citric acid						240 gr.
Water .						8 oz.

If the plate used to make the positive upon is a 4×5 , then take a clean 4×5 tray, hard-rubber or a composition tray (no other kind), mix together two ounces of the above, then immerse the plate, rock the tray slightly, when it will be found that in the course of a few minutes the film puckers at the edges. The gelatin film can now be lifted clean off the plate by the forefingers and thumbs of each hand, then laid carefully into another larger tray of clean cold water.

The piece of patent leather that is to receive the film must be previously rubbed over its surface with a sugar syrup until no greasiness is observed, when a little clean water is allowed to run over the surface. When in this condition the

gelatin film may be lifted from the water, dried slightly, then laid down upon the already wet surface of the leather. See that there are no air bubbles formed. If there are any, use a soft camel-hair brush (an ordinary quill brush will do); dip it into clean water and stroke it lightly over the surface of the film. Any air bubbles that may be present will become easily removed by this treatment. The film and leather must now be left in a horizontal position to dry. A piece of thick blotting paper placed upon a sheet of glass forms a very good support for this operation, as the film is not submitted to any pressure for transferring as in the case of the collodion image. The drying of the film will occupy four or five hours. As soon as it is dry it may be placed in a printing frame upon a piece of clean glass, simply to flatten the leather out evenly, when it may be cut to the shape and size required. In the case of celluloid, or mica, a mixture of white gum arabic must be made up, as follows:

Picked gum arabic . . . 1 oz. Water 4 oz.

Allow the gum to soak for several hours, stirring occasionally with a silver-plated fork. The bottle should be stood either in a warm place or placed into a vessel of warm water until the gum has all dissolved. It should then be filtered into a clean wide-mouthed bottle through a piece of cheesεcloth which has been wetted and then wrung out to get rid of the excess of water. It will now be found that the gum solution is free from dirt particles and fit for use. To transfer the gelatin film to celluloid proceed as follows: Clean the surface of the celluloid well with a tuft of absorbent cotton dipped into water in which a small quantity of strong ammonia water has been added. This will rid the surface of any slight trace of grease or adherent dirt. Rinse the celluloid in a stream of running water, then pour a small pool of the gum solution upon the center; drain the excess into the stock bottle, then place the celluloid under a light stream of water for a second or two. This will wash off the bulk of gum solution, but there will be just enough left upon the surface to cause perfect adherence of the gelatin film. If any air bubbles should be found, treat the film just the same as in the case of the patent leather with the camel-hair brush, and allow the film to dry in a horizontal position. The reason why these gelatin films must be dried lying flat is because the weight of the film is apt to cause a slight cracking if placed upright by its drying upon the top or side edges first. It will be found that the film adheres perfectly to the celluloid by this means. If mica is used it must be treated in the same way as celluloid. The gelatin surface is admirably suited for coloring, giving as it does an excellent tooth. These celluloid or mica portraits may be backed with either black velvet or black varnish. The following developer answers the purpose well for developing a clear and thin image suited for the transfer process:

No. 2		
Sulphite of soda		60 gr.
Water		5 oz.
Dissolve and add to No. 1.		
No. 3		
Carbonate of soda		35 gr.

added last, then shake the mixture well until the carbonate of soda is quite dissolved. Make up a solution of

Bromide of potassium $\frac{1}{2}$ oz. Water $\frac{1}{2}$ oz. $\frac{1}{2}$ oz. $\frac{1}{2}$ oz.

When the above mixture is quite cold it is ready for use. To develop take four ounces of the developer and add four or five drops of the bromide solution. This will aid in giving clear shadows, and if there is more than one plate to develop the developer may be used several times without any further addition of the bromide solution. To secure the best kind of image do not overexpose, keep the time of exposure down. If the exposure has been too long, then the shadows become clogged in the whitening process and the brilliant clear image desired will not be obtained. In every other respect there will not be any difficulty in securing good and satisfactory results.

The process described for the stripping of the positive image applies also to the stripping of a negative film. The use of this will be apparent to everyone who has had the misfortune to break a negative, especially where the gelatin film is not ruptured. In applying this stripping process to a negative the film must be well hardened by treating the negative with the chrome alum solution described, or with a solution of formal-dehyde to prevent the film from expanding by the absorption of water. In every other respect the film can be stripped and transferred to a clean glass plate in just the same way as has been described for the transfer of a gelatin positive, and thus a valuable negative can be saved.

When a gelatin positive has been transferred to patent leather it may be perfectly protected against the action of moisture (even when colored) by dipping the complete picture into a saucer containing a small quantity of alba varnish. This varnish does not affect the pliability of the leather nor cause the colors to run; it forms a thorough protection for the gelatin film.

Novel Method of Varnishing

Some workers can never acquire the knack of varnishing a negative without getting more of the varnish on their coat sleeves, or on their arms, than on the surface of the negative. The difficulty may be avoided by making the varnish in a watery solution and soaking the negative in it after washing and draining. The formula is: Borax, 1 oz.; orange shellac, 5 oz.; water, 20 oz. Dissolve the borax in water by boiling and add the shellac, broken up into small pieces, and keep hot until all is dissolved. Filter, or allow to stand for a few days, and use the clear solution. The negative, after washing and draining, is placed in the liquid and rocked for about ten minutes, after which it is taken out, the glass side wiped clean, and stood up to dry in the usual way.—Professional Photographer.

Paste Mounting of Prints in Quantities

At first sight it would seem that the process of what is commonly termed "wet" mounting is such a simple one that little can be said about it, but the inexperienced hand will find, when his work is finished, that it looks very rough when placed beside that executed by a skilled worker. who has probably taken less than half the time over it. As a general rule the prints will be either bromides or gelatino-chlorides, commonly called P. O. P., and have to be mounted when in a wet, or at least very damp, condition. The first thing to be considered is the making of the adhesive, and this may either be starch, flour paste, or the now popular dextrine mountant, which is better if purchased ready for use, but which may be home-made if certain precautions are observed.

Starch paste is most generally used, as it is cheap, works smoothly, and sticks well if it is of good quality and properly mixed. An old hand can at once tell by making up a small quantity whether the starch has good adhesive qualities, but the tyro might condemn a good sample because of bad mixing. It is therefore advisable to get a good quality, such as the Glenfield photo starch to start with, although I have found some of the cheap laundry qualities to work equally well. And here I may say that it is not necessary to insist on having white starch, as blue starch is practically white when dry. It is impossible to give exact proportions of starch and water, for some brands are more gelatinous than others and will make a firm jelly with more water than others will stand. As an average it may be reckoned that two heaping tablespoonfuls of dry starch should be allowed for each pint of paste. The starch must be mixed with cold water into a smooth thick cream, no more water being used than will enable this to be done.

When there are no more lumps boiling water must be poured upon it direct from the kettle until it turns clear, stirring all the time. The water must not merely boil, it must "gallop," and the kettle should be large enough to retain the water at boiling-point while the starch is being made. If the solution does not clear and thicken properly it is a sign either that the water was not hot enough or that too much cold water was used in the first mixing. In such a case the paste must be put in a saucepan and brought to boiling-point. If still too thin, throw it away and try again. If successful it must be set aside until perfectly cold before using. If used warm the prints will curl off the mounts when dry. When cold it is a good plan to squeeze the starch paste through a piece of strong muslin, to break up any lumps and to leave it in good condition for spreading. Many do not take the trouble to do this, but take the top skin off with a knife and use straight away. Starch paste must be used fresh. In cold weather it may be used a day old, but in the summer it must be used the same day. Neglect of this may cause faded prints, and the fact that the fading is in streaks at once convicts the mounter.

A good paste may be made from wheat flour mixed with water to a thin cream and then boiled till it thickens. A few drops of pure carbolic acid, added when mixing, will keep it in good condition for several days. Flour paste

is more likely to go mouldy if the prints are kept in a damp place, so that as a rule starch is to be preferred; the latter is also less visible on the mount if it squeezes out round the edges.

The white dextrin mountant sold under various names and perfumed with various preservatives is admirable in use, and its extra cost is the only point against it. It can be made at home if a good sample of dextrin be used and special attention be paid to the temperature when making. I failed for a long time to get a good jelly, but found that this can be done by closely following the directions given in the current British Journal Almanac, which are as follows:

Dextrin, best white $2\frac{3}{4}$ lb. Water at 160° F. 80 oz. Oil of wintergreen 15 min. Oil of cloves 15 min.

Put the water in a vessel standing in a larger vessel of water kept within one degree of 160° F. Stir in the dextrin slowly, and when it has all dissolved add the two preservative oils, stirring all the time. Then pour into bottles, allow it to cool, and cork. Put aside into a cool place for a week or two for the mixture to congeal to a firm white paste. It should be noted that success greatly depends on the correct temperature being

maintained when mixing.

Having prepared our paste, we come to the actual work of mounting. For this we require a clear bench, a sheet of plate-glass, a few sheets of fluffless blotting paper, a roller squeegee, and a good bristle brush. The prints, which have been put into a dish of water until quite limp, are taken out singly and laid, more or less evenly, face down upon each other on the plate of glass. This is then stood upon edge until the water ceases to drip off. It is then laid flat upon the bench and covered with two or three sheets of blotting paper, upon which the squeegee is rolled until the pad of prints is as dry as possible. About fifty prints may be treated at a time, and if several glass plates are used other batches may be draining while the first are being pasted. It is convenient for two people to work together if any considerable number of prints has to be dealt with, one pasting the print and putting it in position on the mount and the other rubbing down. A good large sash tool is the best brush for applying the paste, and if new it should be "bridled" with string for about half its length. The back of the top print should be evenly coated with paste and lifted from the pile with a blunt knife. It should be deftly seized with the thumb and finger of each hand without touching the edges or corners, turned over and placed in its correct position on the mount. If any adjustment is necessary the print may be slidden without raising it. It is now rubbed down by the hand with a sheet of blotting paper to protect the surface, and any mountant which may have oozed out removed with a fine damp sponge. Some workers rely on the sponge for rubbing down and cleaning as well, but if there is any tendency for air-bubbles to appear it is safest to use the paper as well, even using the roller squeegee if necessary. It is, of course, essential that no trace of the adhesive should be visible round the edges of the print, and for this reason starch is the best to use, as it wipes away quite cleanly and leaves no gloss or smear

on matt-surfaced mounts.

Enamelled mounts are fortunately almost things of the past, but if any have to be dealt with the starch should be made as thick as it can be worked with the brush and the prints should be no damper than is necessary for them to lie flat. The print must be laid accurately in position, as any shifting will show, and the rubbing down must be done gently, so as not to force the mountant out. The dextrin mountant is good for this class of work, as only a very thin coating is required.

When using dextrin mountant care must be taken not to dilute it by having the prints too wet or there will be a tendency for the edges to come up when dry. If the mountant gets too dry in the jar it will usually be sufficient to pour some cold water in and to pour it out again, and then to work the paste up with a brush or stick. Dextrin has the advantage of allowing a print to be readily unmounted at any time by simply placing between wet blotting paper for a couple of hours, when it may be stripped off without difficulty. It is almost impossible to unmount a starched print after it is thoroughly dry.

For large work a soft sponge is often used instead of a brush to apply the starch, but as this ensures the fingers always being covered with paste it is difficult to keep the surface of the prints clean. If the prints are over 15 x 12 it will be found convenient to have the mount in a vertical position while placing the print upon it, similar to the methods of the paper-hanger. It is then easier to see whether it is put on

squarely, and saves shifting.

Nothing looks worse than small lumps, hairs, etc., under the print. If they are seen while mounting they can be removed, but this wastes much time; it is much better to see that no dry mountant is adhering to the edges of the jar or basin, and that the brush is quite clean to start with. As soon as the hairs begin to come out of a brush it should be thrown away. Mounting is a simple matter, but to do it well these little details must be carefully attended to. Make your paste as thick as it will work, but apply a thin coating. Squeeze as much water out of the prints as you can without marking them (some use a clean towel for this). Rub down quickly and lightly. See that all materials, bench, etc., are scrupulously clean. Remember that it is easier and safer to dust or clean a mount before the print is on it than afterward.—British Journal of Photography.

The Care of Lenses

The lens is a delicate instrument, quite apart from its breakability, and requires much more care than it frequently receives. The greatest fault, of course, is letting it drop. If this breaks the lens the worst is known at once, but it is quite easy to make a lens worth only a quarter of its original value by dropping without breaking it. A very slight blow will even put a strain on the lens which will quite spoil its defining power. If a lens is screwed up too tightly, you put a strain on the glass which is liable to spoil

its working properties. Should the lens be dropped and not broken, it should be examined critically, and if not working correctly it should be sent to an optician for repair; it is not a good practice to try to do it one's self. Another injury caused by damp is shown as rust, and it is surprising how many lenses suffer from it. If slight it does not do much harm, though it may affect the speed of the lens as well as the definition. The rust may be detected by holding the lens to the light, when it will appear as mottled patches on the glass. It is invariably caused by carelessness, and is a very common occurrence in moist climates, where it is difficult to keep a lens from condensed moisture. As a general rule it can be cleaned off, but frequently it affects the polish, when it must be sent to an optician to be repolished. Corrosion is another defect often caused by dampness. Lay the lens on a piece of black velvet and apply a magnifying glass to the surface, when the corrosion can be seen as little pits in the lens. To avoid this the lens should be kept in a case or wrapped in wash leather. The most common injury, of course, is scratches on the surface, and users hardly realize how tender the surface of the lens is. When once through the top surface or skin, the glass is very much softer underneath. When cleaning a lens, care should be exercised as to the cloth used. China silk, Josef papier, velvet or velveteen will be found very suitable. The use of gritty cloths will cause small scratches, too small to be seen individually, but they are very injurious, much more so than a really bad scratch, which possibly may do very little harm.

Some lenses are composed of several lenses cemented together with Canada balsam. After a time this cement may commence to give way, which is seen by an iridescent appearance in the lens. The only cure for this defect is to have the lens uncemented and again recemented with

fresh balsam.—Process Work.

Reduction of Bromide Prints

FORMULÆ for reducing bromide prints are to be found in text-books, but it is rarely possible to make use of them, owing to the great action of the silver solvent (generally an iodine compound) on the lighter parts of the image. Now in many cases, writes Mr. C. Harold Smith, in *Photography and Focus*, possibly it is not worth while to attempt a remedy; but through error, accident, or perhaps an assistant's blunder, enlargements or a large batch of prints may be spoiled. To save such prints by a simple method is certainly worth while, particularly when such method is easier and quicker than reprinting; more particularly when the reduced prints are practically indistinguishable from those correctly printed and developed.

The system I am about to describe was discovered during toning experiments; but its value being at once apparent, trials were made to put it on a practical basis. The means employed are simply bleaching a part of the image away, and after washing, removing the bleached silver compound in hypo, which, of course, does not

touch the unacted-on portion.

The ordinary ferricyanide and hypo reducer,

as is well known, acts on the lighter portion of the image to a far greater extent than on the rest, and also has a tendency to give a fringe of color between the lighter and darker parts of a bromide print. Even the addition of a bromide or similar compound to the potassium ferricyanide and hypo solution does not prevent this. I have made trials, mixing the identical bleaching bath with the hypo solution and treating a print therein, only to find the lighter half-tones eaten away and the fringe of color between.

But the result of keeping the bleaching and hypo baths separate, and using a very weak bleaching bath, is that the darker portions are reduced to a greater extent than the lighter, the delicate tones being thus preserved. The color of the prints remains unchanged. It is absolutely essential, however, that the bleaching

bath must be weak.

Bleaching Bath

Potassium ferricyanide (5 per	
cent. solution	5 dr.
Sodium chloride (common salt,	
10 per cent. solution)	5 dr.
Water	20 oz.

The prints to be reduced are soaked in water until limp, then placed in the above bleaching bath for from three to eight minutes, or more, according to the amount of reduction required; then well rinsed and transferred to a large dish of water. When all are complete, and a large number can easily be treated at a time, they are given several changes of water, and placed in an ordinary plain hypo bath, two ounces to the pint, for ten minutes, and properly washed afterward as usual. The bleaching solution should be thrown away after use; an old bleaching solution would not tend to regularity of working. The process of reduction can be watched fairly easily, simply remembering that the reduction must not be carried, apparently, as far as is required. This of course is owing to the presence of the bleached image, which is subsequently removed by the hypo.

If, however, a slight degree of reduction only is required, the image will scarcely appear to change at all in the bleacher. In such cases time measurement is the easiest. In three minutes (at 60° to 70° F.) such bleaching is scarcely visible, while in actual fact quite a considerable

action has taken place.

Uranium Toning

At one time the only toning process for bromide prints, this method is now almost discarded. The drawbacks to it are rather numerous. The prints must be absolutely free from hypo, otherwise fearful stains are the result; the prints are intensified as well as toned (the greater the toning action, the more the intensification); and, lastly, the toned print must be both briefly and cautiously washed, to avoid general or patchy weakening of the tone by ordinary tap water. Add to these disabilities the fact that the majority of uranium-toned prints have not proved permanent, and it is not to be wondered at that the method has fallen

out of use. Its inclusion in the present monograph is intended as a deterrent against its use, despite the quite pleasing and characteristic chocolate-color tones which it gives. Still, to give uranium its due, we must record the experience of such careful workers as Mr. Welborne Piper, that the results have proved perfectly permanent in the sense that the tone has improved rather than otherwise with time. fore, while space cannot be devoted to the full details of the method, the following points essential to success, and quite disregarded in most of the text-book articles on the process, may be mentioned: Metol or amidol is better than ferrous oxalate as a developer. A light print is needed. The fixing must be thorough, say fifteen minutes in hypo, 3 ounces to the pint. Hypo must be thoroughly removed by an hour's washing in running water, followed by fifteen minutes in alum, 2 ounces; citric acid, dounce; water, 20 ounces; and a further washing for three-quarters of an hour in water. The working toning solutions should be very weak, much weaker than advised in the usual formulæ. Convenient stock solutions are: A. Uranium acetate, ½ ounce; water, 25 ounces. B. Potassium ferricyanide, ½ ounce; water, 25 ounces. The ferricyanide solutions should be made up at the time of use. These 1 per cent. solutions are diluted to give 1 part of each chemical in about 3000 parts of water; that is, 1 ounce each of A and B should be diluted with water to form 30 ounces of toner, adding also about 15 to 20 minims of glacial acetic acid per ounce of toning solution. After toning, the print is placed direct in a 1 per cent. solution of ammonium sulphocyanide for a minute or so. This clears the whites of any yellow stain; a very short wash in still water (several changes) is sufficient. The print should not be washed in running water, as any local current of water on them is apt to produce a mark due to a greater action of the water. Also any drops of water adhering to the print should be blotted off before putting out to dry. With these precautions taken, it is found that the only change which takes place in a uranium-toned print is the appearance of a silvery metallic sheen on the shadows. Rubbing with pure hard vulcanized rubber will remove it, while varnishing the print with a celluloid varnish, or the convenient "Agfa" zapon lac, will prevent its appearance. Worked on these lines, the uranium process may be called fairly reliable. The question is whether the game is worth the candle.

Fixing Handwork

Pencil or stump work on a print or enlargement can be fixed by spraying over the surface with a scent diffuser, some "fixatif." This can be bought ready prepared, or it can be made as follows:

		7				
Mastic						. 0
Amyl acetate	•		•	٠	٠	1 oz.
	В	3				
Celluloid cutting						3 gr.
Amyl acetate .						1 oz.

These two, when quite dissolved, are mixed together, and strained through a tuft of cottonwool into a well-corked bottle. The spraying should be done sparingly, and the surface should not be touched until it is quite dry.—Photography.

Washing under the Tap

THE following dodge will be found to allow of more efficient washing being given to a batch of prints which are washed by allowing the tap to run on them as the prints lie in a dish: Select a dish in which the sides slope outward very slightly. The majority of porcelain dishes have the requisite slope, and the only ones not suitable are those with quite vertical sides. Arrange the dish so that a fairly strong stream of water falls vertically on the center of one of the shorter sloping sides. If the water in the dish is stained a port-wine color with permanganate, it will be found that the whole of the color in a 10 x 8 dish will disappear in two minutes or less. This is the test for efficiency in changing the water. Then place twenty or thirty quarter-plate prints in the dish. If the water is running with a sufficient force, the whole will keep constantly on the move, each print continually changing its position, and never clinging to any other print.—British Journal of Photography.

Pyro

Developers come and developers go, but pyro—"good old pyro," as some enthusiasts call it—endures; the mainstay of the great majority of photographers. With all the advantages that are claimed for the newer products, the sale of pyro, it is said, is larger today than ever. It may not be time wasted if we look into the causes for this firm hold upon the affections of the photo-

graphic public.

Pyrogallic acid is not an acid, but the name clings to it. The term owes its origin to the fact that the substance was first made by heating gallic acid and collecting the vapors which were given off, which vapors on condensation proved to be what is more correctly called pyrogallol. However, as photographers generally call it pyro, they are exposed to no animadversion on the ground of inaccuracy. Pyro is on the market in two forms—as a light feathery powder, so bulky that it takes a half-pint bottle to hold an ounce, and as small, compact crystals, which only take up about one-tenth as much room. Except in this matter of bulk, there is nothing to choose between the two products; in fact, the writer even prefers the bulkier snowy form, because the bottles in which it is sold are more

Pyro is poisonous, though not excessively so: five grains are said to be sufficient to kill a dog (St. Bernard or King Charles not specified). In dry form it will keep as long as can possibly be wished, certainly many years, without any alteration, even in a loosely corked bottle.

Unfortunately for the photographer, he wants it in liquid form, for convenience of measuring; and, although there are great differences between the keeping properties of different solutions of pyro, there is not one of them that can be said to keep well. Sooner or later it will get dark and muddy, and lose much of its developing powers. The reason for its bad keeping quality is that it gradually absorbs oxygen from the atmosphere, and the oxidized pyro that results is a blackish substance, insoluble in water, and quite useless as a developer. The absorption of oxygen goes on slowly even when there is acid present in the solution, but is most rapid when the liquid is alkaline. This can be seen by adding a few drops of hydrochloric acid to some water in one glass, and a few drops of ammonia to some in another, and then adding to each a little pyro. The solution made alkaline with ammonia at once discolors. Still, it is this avidity for oxygen that makes it useful as a developer; so that, however we may use acid to preserve the stock solution, we must make the developer itself alkaline when we apply it to the plate.

The best acid to use as a preservative of pyro solution is sulphurous acid, and this not only prevents the pyro from oxidizing, but to some extent reduces the discoloration produced by the oxidization. We may add the sulphurous acid itself to the solution, as was done in the case of the once popular "Beach's Developer," or we may add it in the form of sodium sulphite or potassium metabisulphite. The latter is of itself a strongly acid salt; the former needs the addition of a little free acid—sulphuric or citric is generally used-to liberate the sulphurous acid which is to preserve the pyro. In some of the older formulæ no sulphite was used, but the pyro just dissolved in water acidulated with hydrochloric, citric, or other acid. These solutions are serviceable enough today, but they do not keep very well, and the sulphite plan is decidedly to be preferred.

In dissolving pyro, considerable difference is made in the keeping quality of the solution according to the water that is used. All water, in the ordinary way, contains a great deal of air dissolved in it, and if we use this water to dissolve the pyro, we are providing it with a ready way of obtaining at once a supply of oxygen for its oxidation. We can get rid of most of the air by boiling the water; and, if we allow it to boil briskly for a few minutes and then to get cold without any agitation, there will be decidedly less air in the water than before; and pyro solution made with it will keep its color and its developing power longer. Any subsequent shaking up tends to dissolve air again. This explains how it is that pyro solution must not be filtered. The filtration exposes the liquid to the air so much that much air is dissolved and the solution rapidly discolors.

The formulæ for stock solutions of pyro are almost infinite in number, and there is little to choose between many of them. Let us see for a moment what are the qualities such a solution should possess. First, of course, it must keep in good order for a reasonable time; second, it must be of known strength, so that when we take any definite bulk of it we know how much of the pyro itself we are adding to the solution; finally, it must not be unduly acid, or the acid will neutralize some of the alkali which we add to it in making up the developer, and we shall not know the alkalinity of the developer. A

reader may say that he does not know the alkalinity of his developer, and does not care. True enough in one sense, but in another it is not so. He knows—or at least the plate-maker tells him—that the plates will stand such and such a developer. If he alters the quantity of acid in the pyro solution, although the acid itself may have no direct effect on the plate, it will have an indirect one by altering the quantity of alkali in the developer by neutralizing more or less of it. It is best, therefore, to keep the quantity of acid as low as is consistent with good keeping

qualities

The formula I myself employ is a very simple one: 120 grains of potassium metabisulphite are crushed and dissolved without agitation in about 6 ounces of cold boiled water. I generally put it in overnight, and find it dissolved in the morning. The liquid is then poured into an ounce bottle of pyro, and the pyro immediately dissolves. It is then poured back into the measure, and more of the boiled water is added until the total bulk is 9 ounces 1 dram. This forms a 10 per cent. solution of pyro, which may be bottled off and is ready for use. It will keep in good working order for several months, but after the first month or so there will be a gradual

decrease in its power.

Such a pyro solution may be used with any alkali which is preferred, but in my own case I never employ any but soda. Some, however, prefer to use pyro ammonia, and as I used to do so myself at one time, I will give the formulæ. The other solutions required are 10 per cent. potassium bromide, made by dissolving 1 ounce of the substance in 4 or 5 ounces of water and diluting it to make 9 ounces 1 dram, as before; and 10 per cent. ammonia, made by taking 1 fluidounce of the strongest liquor ammonia and diluting it to make 10 ounces. Unless stained negatives are preferred, a 5 per cent. solution of sulphite, which should be freshly made up, will also be wanted. The strength of the developer must be adjusted to suit the plates. The most generally useful I have found to be made by taking for each ounce of solution:

Ten per cent. pyro . . . 20 min.
Ten per cent. bromide . . . 10 min.
Ten per cent. ammonia . . . 30 min.

This was made up to 1 ounce by using the 5 per cent. sodium sulphite solution in place of water. By substituting plain water for it, a

greenish-yellow negative results.

Pyro-potash is hardly ever heard of now, and a formula cannot be of any use, particularly as there is no perceptible difference whatever between its behavior and that of pyro-soda. The latter I employ by making up a stock solution of sodium sulphite and sodium carbonate, 1 pound of each being dissolved in 3 pints of hot water and diluted when quite dissolved to make 4 pints. This is practically a 20 per cent. solution of each, and in this concentrated form the sulphite will be found to keep very well, certainly for a month or two. Weak solutions of sulphite do not keep at all well, and the carbonate also seems to prevent to some extent the deterioration of the sulphite.

Any plate that is now on the market for negative-making, so far as I am aware, can be developed with these two stock solutions of pyro and carbonate and sulphite. Unless the proportions are specified by the maker, a developer, each ounce of which contains

Ten per cent. pyro solution . 20 min.
Twenty per cent. sulphite carbonate solution 2 dr.
Water to make 1 oz.

will be found very suitable; in fact, it has answered with all the plates with which, so far, I have ever tried it, without any exception whatever.

Statements are sometimes made that pyro gives density and that metol gives detail, and distinctions of this kind are drawn between the different developers. This seems to be very mischievous in its effects on inexperienced photographers. If they are using a developer which is not supposed to give density, such as rodinal or metol, and they cannot get density, they at once put it down to the developer. Yet the more I see of different developers, and of the way they behave in different hands, the more convinced I am that these distinctions are futile and largely imaginary. Certain am I of this one fact, and that is that I can get with the formula for pyro-soda just given as much density as can be got with any other developer whatsoever, or as much detail and as soft and as harmonious a result as can be got with any other. Superficially, developers differ; some seem to flash up all the image at once, and then gradually build up density, while others seem to bring out the the image more gradually; but when development has been properly carried out, and carried to the proper stage, there need be no difference whatever in the results.

Why, then, do so many prefer pyro? First, it is beyond question the most economical developer, going as far as any other and costing about half as much. Then it keeps fairly well in solution, as developers go, seems to suit all plates, and can be bought anywhere. These are

advantages not to be gainsaid.

On the other hand, it has a nasty habit of staining. By this I do not mean that it stains the plates; used with a proper proportion of sulphite, it is as clean-working in this respect as any of its modern rivals. But, however much sulphite we employ, it will stain the fingers if they are immersed much in it; and this, so far as I know, is the most serious count against it.

A Non-cockling Mountant

 Take:
 Gelatin (Nelson's No. 1)
 2 oz.

 Glycerin
 4 dr.

 Wood alcohol
 3 oz.

 Water
 7 oz.

Soak the gelatin in the water until quite soft, and then dissolve by gentle heat. Mix the glycerin in the wood alcohol, and add it gradually to the solution of gelatin, stirring thoroughly after each addition in order to prevent coagulation. As soon as all the alcohol is added, and the solution is quite clear, it may be drawn off into suitable jars. The jars will have to be placed in hot water to melt the mountant before use.

Restoring Tarnished or Discolored Daguerreotypes

HITHERTO it has been usual to advise those who have a tarnished or discolored daguerreotype which they wish restored, to put it into the hands of an expert in such matters; but time has passed, and those who have worked the daguerreotype process have joined the majority, so that it is no longer possible to act on such advice, and if the work is to be done it must be done at home. We may point out before describing it in detail that the daguerreotype image is of an exceedingly delicate character: the lightest touch may injure it irreparbly; and if its record is a valued one, the most ordinary caution will show the expediency of making a careful photograph of it before subjecting it to any operation whatever. Having got as good a negative of it as we can, we may then proceed to put the restoration in hand.

It was usual to bind the silver plate to a piece of glass by means of strips of gummed paper, so as to exclude dust, and the first operation, therefore, is to get rid of the binding and remove the glass. A little gentle coaxing with the point of a knife will remove the glass and picture from the passe-partout by which it is usually protected, and a few strips of damp blotting paper laid on the paper binding will generally soften the adhesive enough in a few minutes to allow the binding to be peeled away and the glass lifted off without damaging the matt with moisture.

We repeat at this stage the caution that no solid substance whatever, not even the slightest tuft of cotton-wool or the softest camel-hair brush, must be allowed to touch the face of the picture. If there is any dust on it, it may be blown off; but it is better not to do anything of the kind at all, leaving it to wash off, as it is almost sure to do very quickly. To this end the plate, face upward, is placed in a clean dish and a little alcohol poured over it. Only just enough to cover it need be used, and the alcohol should be spirit of wine, and not methylated spirit, as this contains a gummy product, which will be precipitated on the image when water gets to it. After five minutes or so in the spirit, rocking the dish occasionally, the spirit may be poured off and the dish put in the sink under a steady stream of water from the tap. After a few minutes of this, the spirit, followed by the water, will be found to have got rid of any adherent dust, and the surface of the picture will be in the right condition for the next

This is to apply a weak solution of potassium cyanide, a highly poisonous substance, which will remove the tarnish but will not attack the image itself. A 10 per cent. solution of the cyanide may be made up, and then putting a couple of ounces of water into a graduated measure, a dram of the cyanide solution is added to it, the mixture is swirled round, and poured over the picture in the dish. The dish is rocked for half a minute or so and watched to see if the tarnish dissolves. At the end of a minute the solution may be poured back into the measure and strengthened with another dram of the strong cyanide solution, and the operation repeated. This can be done again and again

until as much of the cyanide solution as of the water is present; but it is not likely that anything like such a concentration will be needed, unless the sample of cyanide in use is very old and has deteriorated.

As soon as the tarnish has vanished, or sooner if there is the slightest sign that the image is being attacked by the cyanide, the solution must be poured off at once and the dish filled with water, which is changed several times, to wash away the cyanide as quickly and as completely as possible. The washing need not be very prolonged, as there is no absorbent film of gelatin or other vehicle, the whole of the action lying on the surface. Ordinary tap water can be used for the operations up to this point, but the last washing of all must be in distilled water, as the impurities in tap water would leave a mark on

the surface of the picture on drying.

So far there has been nothing which calls for any dexterity or skill; mere ordinary care to avoid touching the face of the picture, or allowing the cyanide to act too far is all that is required. But for drying the plate something more is needed, if it is to be left spotless. It must be taken out of the dish of distilled water in which it is lying, and held with a pair of pliers at an angle of 45 degrees by one corner diagonally, so that the lowest corner is next to that held in the pliers. A Bunsen burner or spirit lamp will be required, and then, after pouring over it a fresh lot of distilled water, holding it all the time at the one angle, the top corner is brought over the flame, and several inches above it, so that the warmth begins to dry it off. As it dries the plate is gradually moved over the flame so that drying may proceed steadily downward until it is complete. Any pause in the drying is apt to leave a mark, and if the plate is made at all hot the image will be injured. When dry the matt and glass should be replaced and the picture bound up at once before there is any chance of it getting injured.—Photography.

Carbon Transparencies

By transparencies I refer, in this article, more especially to lantern slides; at the same time, what is here written also applies equally to all classes of transparencies, be they large ones for framing, slides for the stereoscope, or for the

making of enlarged negatives.

It is strange that so much has been said and written upon the advantage of using the carbon process when making transparencies for use in making enlarged negatives, and yet so little upon its use for lantern-slide work, most text-books and writers passing the subject over with two or three lines. Further, although our trade workers almost invariably use the carbon process for the production of large negatives, they almost as invariably send out transparencies made by any and every process but carbon, except where specially stated on the order. Why is this? Is it that they use the process that first comes to hand when doing this class of work; or is it that the photographic public will not have carbon work? That silver does not yield nearly so good results as carbon goes without saying, though I do not intend to infer that good lantern slides cannot be made by the use of the many brands

of lantern plates in the market. Far from it. At the same time there is no process that yields the best results with such ease and certainty as the one under consideration; no method that is less likely to yield a transparency that is not good, and that at the same time is accepted, to save trouble, as good enough. Further, the very mention of the word carbon to most workers simply gives them fits, and one who knows the process is almost inclined to also have fits of laughter, at the look of horror upon the face before him, knowing that the whole thing is so simple, as he does. In fact, an amateur, while watching me at work not long ago, exclaimed, "Why, carbon is merely child's play." I do not intend to say it is so easy as this, yet, for certainty of results, once the initial stages have been overcome, no process can come near it, and, if anything, a transparency is more easy to make than an ordinary carbon print.

The tissue may be obtained either ready sensitized or not, according to the time it is likely to be kept by the user. Sensitizing is, however, so easy that no one need fear to undertake it, and sensitize his tissue one or two days before he intends to use it. This course will give him the advantage of being able to prepare just the number of sheets wanted; and, moreover, he can stock and prepare various colors, and thus there is no need for one to be somewhat bound down

to one color for one day's printing.

The real trouble is that of drying the tissue, after the bath, and the following hints may be found useful. The sensitizing bath is prepared as follows:

The cut tissue is immersed in the solution for thirty seconds, taking care that no air bells form on the surface, it is then drawn over the edge of the dish, and laid upon a sheet of glass or zinc and lightly squeegeed (with a flat, not roller squeegee), to get rid of the surplus moisture, and hung up to dry, using either wooden clips or pins. The solution should not be over 80° F., but, on the other hand, the tissue may be allowed to remain in, in winter, for from forty-five to sixty seconds. It is best dried in a room in which a fire has been burning during the day, the sensitizing being done at night by gas or lamplight, the tissue is hung near the fire-place pinned to a clothes-horse or to the edge of the mantelpiece, the clothes-horse being, say, five or six feet from the fire, it will be dry, ready for printing in the morning. The blinds must, of course, be drawn, to exclude all white light. The *great point* in drying is to watch that it does not take too long, if it does trouble in stripping is likely to result.

Another point that frightens amateurs is the coating of the glass with the gelatin substratum; this is not necessary, neither is the operation of coating the tissue with collodion that is sometimes recommended; both these are intended to prevent the delicate high-lights from being washed away during development, whether they do so or not is an open question; I have used the tissue with and without collodion, the glass with and

without the subtratum, and with and without either or both, and I have failed to find the supposed difference that is said to be shown, or any fault that could be put down to the non-using of, or any advantage that I could trace to the using of either the substratum or collodion. It may be that I always keep my tissue some two or three days prior to using, if this is so, I see no reason to deter others from doing the same, it certainly is in better working condition, if kept this length of time after sensitizing provided always that it is

kept perfectly dry.

The great thing is to have the glass chemically clean. The tissue after exposure to light (with the usual safe edge using either a print meter or another negative as a guide to printing, i. e., a negative of as near as possible the same density with a slip of P. O. P., by the time the P. O. P. is printed to finished, not toning depth, the tissue will have had sufficient exposure), is then soaked in cold water until it has become limp, the glass is then slipped under it, and both withdrawn together, the face of the tissue being in contact with the glass; it is next well squeegeed to get rid of any air bubbles, and put under blotting with a slight weight, for from fifteen to twenty minutes.

The time passed it is placed in warm water, and when the gelatin begins to ooze from the edges freely, the paper is stripped off, and the warm water gently laved or splashed over the print, which is now on the glass, until the excess of gelatin is removed, this being the development. When fully developed it is placed in cold water for a short time to chill the gelatin, and then given from three to five minutes in an alum bath, and finally washed for, say, five minutes, and put aside to dry.

When dry all that remains to be done is to mask and bind up as usual, but remember that the print, being reversed, the spots which mark the side to be placed next the condenser must be placed on the glass side of the slide itself, and not,

as is usual, on the cover glass.

Any tissue may be used for the transparencies or lantern slides, but for the very best results I would say use the special transparency tissue, this contains more pigment and of a finer nature.

Transparencies or lantern slides may be pro-

duced in a variety of colors by using aniline dyes. As a final word, may I say, never use the cushion-shaped masks. For slides they are a mistake, and never should be used. Square corners, please.

Gaslight Emulsions for Plates and Paper

To prepare emulsions with gelatin as the vehicle is not a difficult matter if the formula is correct and the instructions are followed to the letter. This applies to bromide, bromo-iodide or chloride emulsions, all of which are to be employed for developing, and not for printing-out purposes. A large number of formula have been given for preparing *bromide* emulsions; very few, if any, have been published for *chloride* developing emulsions.

Those who are desirous of preparing either plates or paper in a small way can rely upon the formulæ given here to produce good results, moderately rapid and free from fog, the lastnamed defect being the one that has caused endless trouble to so many photographers who have tried to prepare their own emulsions; other difficulties have arisen, but none so troublesome as the above. The writer has tried and tested formulæ almost beyond number to obtain one that could be absolutely relied upon for certainty and sure working in every particular, and after trying and testing every published formula has decided to publish here only those that can be depended upon and easily prepared.

Preparation

To prepare emulsions a separate crock *must* be used for each emulsion, one of half-gallon size, such as is used for the preparation of pickles, is just the utensil, folded in at the neck and pro-

vided with a stoneware lid.

Assuming that it is the intention of the reader of this article to test the formulae here given, three or four such crocks will be required, costing about twenty-five cents each. These must be well washed in hot water, then filled with cold water and allowed to stand twelve hours, then washed or scalded with hot water on the inside, the object being to extract any soluble matter or salts that may cling to the glazing. Use no soap, soda or washing powder.

Chemicals

The chemicals required will be as follows: They must be of the highest purity to ensure the best results. These chemicals are best kept in well-corked, wide-mouthed bottles, and stored in a cool, dry place.

Bromide of amm	on	ium			1	pound
Iodide of potassi	um					ounce
Citric acid, power	ler	ed			4	4.4
Chloride of amm	on	ium			1 1	pound
Stronger water	8	ımm	on	ia,		•
'880					1	6.6
Chrome alum					$\frac{1}{2}$	6.6
Hard gelatin					ĩ	4.6
Nitrate of silver					$\frac{1}{2}$	6.6

A number of glass strips will be required cut from a cleaned 11 x 14 plate, not more than one inch wide. The above size plate is of a suitable thickness for these stirring strips. In addition to the crocks as many ordinary earthenware basins will be required, to be used as covers for the crocks as well as the stoneware lids. These basins must fit loosely over the crocks, as a packing of half a dozen thicknesses of good black paper must be used to make the crock light-tight. During the operation of making the emulsion sensitive a thermometer will be required, one that is set in a tin case or frame, to enable a uniform temperature to be maintained. This is of the utmost importance, because the variation of temperature will cause considerable variation in the quality of the emulsion as well as the sensitiveness. The cost of such a thermometer runs from twenty-five to fifty cents. A moderate-size saucepan or boiler will be needed to stand the stoneware crock in. This boiler must hold about a gallon and a half of water when the crock stands within it. A good quantity of water will

keep up a more even temperature than a small quantity. This point also tells in making emulsions of uniform quality: the crock must stand upon a thin wooden frame so as to keep the bottom a slight distance off the saucepan, thus allowing even distribution of heat. To prepare the emulsion proceed as follows:

The Emulsions

Bromo Iodide Emulsion, No. 1:

Distilled water .		4 oz.
Hard gelatin		250 gr.
Ammonium bromide		·175 gr.
Potassium iodide .		5 gr.

Place the above into a clean crock, stand the crock in the saucepan upon its wooden frame, pour in sufficient water in the saucepan around the crock, three or four inches high; apply the heat by means of a double-ring gas stove; bring the temperature up to 120° F., not higher; reduce the flame so as to keep this temperature uniform; stir up the contents of the crock with the glass strip until the gelatin is completely dissolved and the salts well incorporated. Meantime prepare a solution of nitrate of silver as follows:

Distilled water 3 oz. Nitrate of silver . . . 230 gr.

Stir this well with a narrow glass strip until the crystals are completely dissolved; add to this drop by drop stronger water ammonia, '800, stirring vigorously at the same time. The instant the ammonia touches the solution a dark brown precipitate is formed of oxide of silver. The ammonia must be added only a drop at a time, until the oxide of silver is redissolved with ammonia of the above strength. About half an ounce will produce the desired result. Be very careful when the liquid is clearing up that the ammonia is added very slowly. As soon as the cloudiness has nearly disappeared stop the addition of ammonia, stir well, when it will be found that the liquid will become quite clear. It is now ready to add to the contents of the crock; remove the crock and repair to the dark-room; stand the crock upon a towel, and tilted, so as to allow the emulsion to drain to one side; remove the lid, then add the silver solution, a few drops at a time, to the warm gelatin mixture, stirring with a glass strip vigorously at the same time. When the silver solution has been all added, replace the stoneware lid, place over this half a dozen sheets of black paper, then press the basin down over this, which forms a packing that is completely light-tight. As the operation of emulsifying is carried out in daylight, the above precaution is necessary. Cut off the stray edges of black paper evenly and return the crock to the vessel with hot water. Keep the temperature at 120° for half an hour; lift the crock out of the water occasionally during this time, and shake round and round so as to keep the emulsion in a thoroughly mixed condition. At the end of twenty-five minutes remove the crock to the dark room and place therein 80 grains of hard gelatin, close the cover and heat for five minutes. At the end of five minutes take the crock into the

dark room again and stir the emulsion well with a glass strip until the last added gelatin has become completely incorporated. Now close the top, well covered once more, and stand it in cold water to set the emulsion; a little-ice may be used if the water is not cold enough.

Emulsifying may be carried on for threequarters of an hour, but no longer. This will give more sensitiveness and still be free from fog.

As soon as the emulsion has become set into a stiff jelly it is ready to be washed. Do not have this emulsion stand for many hours, especially overnight, because the sensitizing still goes on, even when cold. This action will be sure to produce fog. It must be clearly understood that all the operations, from the time of mixing the nitrate of silver with the gelatin solution, *must* be carried out under a deep ruby light.

Washing

The washing of the emulsion must now be proceeded with. Obtain a yard or two of white mosquito netting, or better still the white meshed cloth used for wool work. If mosquito netting is used it must be washed and folded double; if the wool cloth, one thickness will do. In either case the material must be well washed before using. Under a ruby light remove the lid of the crock, place the hand inside, and with the forefinger run around the clot of jelly. should be so well set that it will lift clean and free from the crock. Pour into the crock two pints of clean cold water in which a piece of ice has been melted to lower the temperature. Break up the clot of jelly with the finger. Place a piece of the jelly into the cloth, bring the four corners together, then, with a twisting action, hold the body of the cloth in the left hand, twist the extraneous parts with the right hand. The strain to be exerted will depend upon the stiffness of the jelly. Having found by the squeezing of the first piece that the shreds are fine and uniform, wring the balance of the jelly through in the same way, allowing it to fall into the water contained in the same crock.

Having now broken up all the jelly, unfold the cloth and wrap it folded four times over the top of the crock; tie it well all round with a clean piece of tape. This prevents any contamination from the use of string. Turn the crock upside down, allow the water to drain off, turn the crock over, pour into it through the cloth a quart of clean cold water, swish the crock around rapidly so that the jelly shreds circulate well in the interior, invert the crock once more until the water has drained out well. These two first washings will remove the main quantity of the salts of decomposition. The washing of the shreds must continue in this way for half an hour at least, giving five minutes' time between each change. If washed for one hour in the above manner it will ensure all the decomposition salts being removed, which consist of nitrate of ammonia and nitrate of potash. Both these salts being very soluble in water, there need be no fear of their retention in the jelly after an hour's washing. The cloth must now be removed, and the shreds that adhere to it be scraped off with a celluloid or hard-rubber knife (under no condition use a metal knife), wring the cloth well in a stream of running water from the faucet, fold it up before replacing it upon the crock; tie it firmly; then invert the crock upon the top of another crock or stoneware pitcher, where it must remain for half an hour to permit the excess of water to drain off; now turn the crock over, remove the cloth, scrape into the interior any shreds of jelly that may adhere to the top and cloth; replace the stoneware lid, also the packing paper and basin, when all is now ready to melt and filter for coating either plates or paper proceed as follows for the coating:

Coating Plates

Place the crock, well covered, into the vessel that was used in the preparation with water about two or three inches high; raise the temperature to 120° or 125°. Then lift the crock from the warm water and swing it round and round, so that all the jelly shreds become melted. Now repair to the dark-room, and add one ounce of *pure* alcohol (do not use wood alcohol or Columbia spirit, because both these alcohols cause a subsidence and curdling of the emulsion). Stir the emulsion well with a glass strip during the time the alcohol is being added. Just as soon as the mixture is complete, filter it through absorbent cotton, pressed into an inverted kerosene lamp chimney, with a double thickness of cheesecloth tied over the bottom; as soon as filtered it is ready for use. If plates are to be coated, they must be well cleansed beforehand, standing ready for use. The coating of plates is accomplished by taking one in the left hand, balance it upon the tips of the fingers and thumb, pour upon the center a pool of emulsion from a four-ounce graduate, tilt the plate slightly so that the emulsion flows to each corner, then with a slight incline, return a portion of the emulsion to the graduate, taking care that no air bubbles are formed; then lay the plate down upon a bevelled slate or marble slab to set; treat a number of plates in this manner. When set, place them in a clean rack and stand in a welldarkened closet to dry.

Coating Paper

To coat paper (almost any kind of drawing paper will do) cut up some pieces $7\frac{1}{2} \times 20$ or $2\overline{5}$ inches long, fold the ends three times, so as to form a stiffened strip about half an inch deep; then pour into a clean hard-rubber or composition tray five ounces of emulsion, take up one of the sheets of paper, hold it by the folded ends, bend it into the shape of the letter J, allow the curved end to touch the emulsion, raise the left hand, lowering the right at the same time; perform this operation twice, hold the sheet at such an angle that the excess of emulsion may drain into the tray, just touching the side to prevent air bubbles being formed, then fix the top to the edge of a shelf by two black varnished pins and clip at each corner of the bottom of the sheet two wood These will aid in keeping the paper straight during drying. As soon as dry, cut to size, keep under pressure away from all actinic light until required for use.

Chloride Developing Emulsion

For plates or paper is made as follows: Into a clean crock place the following:

No. 1

Hard gelatin (Heinrich's)		2 oz.
Distilled water		10 gr.
Chloride of ammonium, C.	Р.	108 gr.

Dissolve the above in just the same manner as described for the bromo-iodide emulsion; the temperature may reach 130° F.

No. 2	
Nitrate of silver	252 gr.
Citric acid (powdered)	30 gr.
Distilled water	10 oz.

When the gelatin mixture is ready, which will be known as soon as the gelatin has become completely dissolved. This is aided by occasional stirring with a glass strip. Take the crock into the dark-room, and the acid nitrate of silver solution; exclude all actinic light; pour the silver solution, a few drops at a time, into the hot gelatin mixture, stirring rapidly during this addition; continue until all the silver solution has been added, allow the stirring to proceed for five minutes after the mixture is complete. Now replace the lid, cover with black paper packing, press down the basin, stand the crock in very cold water to set, or place it in an ordinary ice box until the emulsion has become quite set. As soon as this has set into a stiff clot it must be broken up and washed in the same way as already described. If it is desired to keep it for twelve to twenty-four hours before breaking up and washing, then one ounce of pure alcohol must be added at the time the emulsion is made. When this emulsion has been broken up into shreds and washed it can be remelted and used at once. In this case the emulsion forms a much stiffer jelly than the bromo-iodide; it is absolutely grainless and admirably suited for making transparency plates, gaslight opals and paper for printing by artificial light, as it works clean and clear with pure blacks and whites. To coat plates or paper, proceed the same as already described. The developers best suited will also be given at the end of this article.

Bromide Emulsion

A bromide emulsion prepared as follows will give a very sensitive film and work clean:

Distilled water	4 oz.
Hard gelatin	235 gr.
Bromide of ammonium	155 gr.
Stronger water ammonia,	1 dram

Make up this mixture in a clean crock and heat to 125°F. As soon as melted the following must be added very slowly with vigorous stirring:

Nitrate of silver			200 gr.
Distilled water			4 oz.

After the above has been added cover the crock perfectly light-tight as described and heat for three hours at 125° F. At the end of this time add 90 grains of hard gelatin, cut into fine strips,

stir until melted, then allow to become well set. Proceed to break up the jelly, wash, drain and melt for coating as described, adding 1 ounce of pure alcohol previous to filtering.

This emulsion is also suited for plates or paper,

is very soft in effect, giving less contrast.

Developers

Almost any of the modern developers will suit these emulsions, but those that the writer has found the best are made up as follows:

Developer for chloride emulsion:

Metol						20 gr.
Hydroc	uino	ne				40 gr.
Warm	distill	led	wat	er		15 oz.

Dissolve the above and add sulphite of soda, anhydrous (granulated), 140 grains, shake the mixture well until this is dissolved, add 120 grains of granulated carbonate of soda and 17 ounces of cold distilled water; add to this thirty-two drops of a 10 per cent. solution of bromide of potassium (1 ounce bromide potassium in 10 ounces of water). When the above is cold it is ready for use.

Any of the ordinary pyro developing solutions will suit for the plates, but not for the paper.

With the bromo-iodide plates the following potash developer gives excellent results:

No. 1

Pyro Developer for Plates

Distilled water	12 oz.
Sulphite of soda (granulated)	1 oz.
Pyrogallic acid	1 oz.
Citric acid	60 gr.
Bromide of ammonium .	20 gr.

No. 2

Distilled water	12 oz.
Sulphite of soda (granulated)	1 oz.
Carbonate of potash	3 oz.

When developing take 4 drams of No. 1 and 4 drams of No. 2, add 8 ounces of water. If the plates have been overexposed use only 6 ounces of water.

In warm weather the emulsion will require $\frac{1}{2}$ dram of a 10 per cent. pure chrome alum solution added with the alcohol previous to filtering and coating.

The best fixing bath for the chloride plates and paper will be found as follows:

Hyposu	lphit	e o	f sc	da		4 oz.
Water	٠.					20 oz.

Dissolve 2 drams of powdered alum in 10 ounces of water and 2 drams of acetic acid, add this to the hypo solution, stir well, when it will be ready for use.

Photochemical Activity of Ultra-violet Light

The photochemical activity of invisible lightwaves existing beyond the visible violet of the spectrum has long been a recognized fact, and considerable research has been made to determine the nature and extent of the reactions produced. The shortest wave-length of light perceptible to the eye is about 0.3969μ , in the violet end of the spectrum. Rays of shorter wave-length

vary in their activity and effect. Berthelot divided them into four groups: (1) Wave-lengths 0.4 to 0.3μ , comprising the ultra-violet rays that reach the earth's surface in sunlight. These rays are similar to the violet rays of the visible spectrum. (2) Wave-lengths 0.3 to 0.2μ , medium rays of strong photochemical effect, producing marked chemical and physical changes. (3) Wave-lengths 0.2 to 0.15μ , useful in synthetic processes. (4) Wave-lengths 0.15 to 0.1μ , comprising an ultra-violet region which is little known

Among the physical and chemical effects produced by ultra-violet light are many of practical value, affording quick tests for certain properties, and acceleration of certain chemical reactions. The sterilization of liquids such as water and milk, and of semisolids like edible fats, is readily accomplished by ultra-violet rays. Exposure of only a fraction of a second under proper conditions is required for complete sterilization. Most dyes fade rapidly under treatment with ultra-violet light, and some remain fast. Fabrics like cotton, rubber, oil-cloth, etc., reveal in a comparatively few minutes the deterioration that otherwise would not become apparent for days in ordinary light. Numerous organic substances are bleached by its action.

Chemical reactions produced by ultra-violet light are many and varied. Chlorine derivatives of toluol are produced in greatly increased yields and without undesirable by-products if the reaction proceeds in the presence of ultra-violet rays. Other chlor-substitution organic products are formed with greater facility, in greater quantity, and of higher degree of purity if ultraviolet light enters into the reaction. The halogen elements generally seem sensitive to this force and enter into synthetic reactions rapidly under its influence. Cyanogen is converted into paracyanogen, sulphur and phosphorus show allotropism, organic compounds undergo isomeric changes, hydrolytic reactions are accelerated, and numerous other changes occur under influence of ultra-violet rays.

The production of these rays in a manner suitable for application in the arts has been the subject of considerable invention. They are given off in concentrated form from a mercury-vapor lamp, but, since glass is impervious to them, it is necessary to construct the lamp of quartz if the rays are to be used.

An improved form of quartz mercury-vapor lamp which embodies new features in construction and application is manufactured by the R. U. V. Company of New York City. This lamp produces an ultra-violet component several times stronger than that yielded by other forms of quartz mercury-vapor lamps. The wave-lengths of its light have been measured as low as 0.18µ, indicating a high degree of activity according to Berthelot's classification given above.—Metallurgical and Chemical Engineering.

Photography and Tulle

ONE frequently sees on prints a softening of outline, a little haziness which is not an out-of-focus effect, but which lends a wonderful charm to the picture. On inquiry one is told that the

effect is produced by bolting silk held an inch or two away from the bromide paper during enlargement. Or, again, you may hear it is produced by the use of chiffon. But I am assured in my own mind that there is nothing to equal the use of tulle. My own procedure is as follows:

Some cardboard is procured and cut into squares, say, of four inches. Out of the centers of these a square of 3 inches is cut, thus giving us a rim 4×4 , and $\frac{1}{2}$ inch wide. A number of these will be required. I mentioned cardboard as being the easiest material for these, but it would be better if they could be cut out of three-ply or fretwood with a fret saw. Some tulle is bought, either black or white, or some of both. Then the glue-pot is made ready. One of the rims, or frames as I shall call them, is put flat on a board or piece of cardboard, and one thickness of the tulle is stretched tightly over it and kept in position by pins driven into the board, but clear of the frame. A second frame is now taken, one side is covered with glue, and that side put down squarely on the first frame. A weight is put on for a few minutes to allow the glue to harden. We have now one thickness of tulle imprisoned between a pair of frames. The outlying tulle is trimmed off, and the performance repeated by again stretching the tulle over the frame just made and again applying a gluey frame. Thus we have two pieces of tulle, suitably mounted, separated by the thickness of one piece of cardboard. If three-ply is used, there is a greater separation owing to its thickness. This is no disadvantage. It is obvious we can mount four or six pieces of tulle in the same way.

These frames are interposed between the lens and the bromide paper during enlargement. One way of doing so is to bore holes through the frames and thread them on a knitting needle, the latter being driven into the top of the lens panel. Another way is to put them into the bellows behind the lens. I saw this varied once by a man who built a small box between the bellows and the lens. This box had a lightight lid, and just accommodated the frames, which were made sufficiently small for the purpose. He also used this arrangement when taking portraits, and the effect was excellent.

White tulle seems to give more diffusion than black.

The use of tulle, of course, increases the exposure. It will be found fairly correct to multiply the normal exposure without tulle by half the number of thickness of tulle used. Thus, if the normal exposure were ten seconds, then with four pieces of tulle the exposure would be $10 \times 4 \div 2 = 20$ seconds.

It is noticeable that the use of tulle renders retouching almost unnecessary, and it is wonderfully useful in breaking up deep masses of shadow.

When a print is to be thrown somewhat out of focus, tulle becomes invaluable. If tulle is to be used at all making lantern slides it must be used very sparingly as its effect is very marked.

I think that when once this process has been tried its users will feel they have an added power in their hands, though, of course, it can easily be overdone. Personally, I hardly ever make an enlargement without at least a couple of pieces of tulle.—H. O. Fenton, in Australasian Photo Review.

Making and Keeping Developers

WE have noticed from time to time a considerable difference in the behavior of developers, particularly pyro-soda, which were made to practically the same formula by different people. This difference appears to be due not to any difference of quality in the constituents, but to variations in the methods of compounding. The usual procedure is to dissolve the sulphite in hot water often used directly from a geyser or similar device, and as soon as solution is complete (sometimes before) to add the pyro to the warm solution. If metabisulphite be used in addition it is often dissolved at the same time as the sulphite, with the result that some of the free sulphurous acid is driven off, and the effect of the addition is proportionately nullified. If we compare a solution mixed in this way with one made in a more rational manner a very considerable difference in energy will be perceptible, and as energy is what we pay for, it means economy in expenditure in chemicals, besides an improvement in the quality of the negative. The first step to be taken is to boil the water thoroughly and then to allow it to cool, and to precipitate as much of the suspended lime as possible. Of course, if distilled water be used this is not necessary. The next step is to pound the sulphite in a mortar until it is reduced to a coarse powder. This only takes a minute or two, and greatly facilitates solution. The metabisulphite may be powdered at the same time, and the whole dissolved at quite a low temperature. The pyro is then added, and dissolved with as little shaking as possible. The same precautions should be observed when making sulphite solution for amidol developer, and a noticeable improvement in the color of the solution and keeping qualities will result. Another point is the degree of concentration of stock solutions. When an ounce of pyro can be used up in a day or two the practice of making the solution of working strength may be followed, otherwise it is better to use one fourth this bulk of water and to dilute for use as required. Such concentrated solutions keep their energy much longer than weak ones, and, moreover, allow of considerable modification of the strength and proportions of the working developer.—British Journal of Photography.

The Tropical Development of Eastman N-G Kodak Film, Plates and Premo Film Pack Films 1

Although in the regular manuals it is recommended to conduct all photographic operations such as developing, washing, etc., at a temperature of 65° F. (18.2° C.) or 70° F. (21° C.), occasions arise when it is impossible to do this owing to existing conditions. This is especially true in tropical countries where the prevailing temperatures are high, and where it is often

difficult to secure an adequate supply of fresh, cool water.

Realizing the importance of being able to develop and finish films and prints at temperatures which, under ordinary conditions, would completely melt the gelatin film, the Eastman Research Laboratory has carried out a large number of experiments, and as a result we are now in a position to give definite instructions for handling roll film and film packs at temperatures as high as 95° F. (35° C.). This has been made possible by the discovery of a new tropical developer which gives results full of snap and free from fog at high temperatures, and does not diminish the effective speed of the film like a developer restrained with potassium bromide. Moreover, the nature of this developer is such that it will not appreciably soften the gelatin film during the time required for development, so that after leaving the fixing bath the film is not abnormally swollen and may be handled like film developed at ordinary temperatures.

The method of procedure is just the same as usual, except that a special fixing bath is required in conjunction with the tropical developer, one containing chrome alum for temperatures up to 85° F. (29° C.), and one containing formalin at temperatures up to 95° F. (35° C.)

The difficulties usually encountered when working at high temperatures are fog, softening of the film, pinholes, and reticulation of the film. None of these will be met with if the following instructions are carefully followed, but it is important that the solutions employed, namely, the developer, fixing bath and wash water should be maintained at the same temperature. If this is not so, that is, if the wash water is a few degrees warmer or colder than the developer or fixing bath, a leather-like graininess will appear all over the surface of the film, of a greater or less degree of coarseness according to the extent of the temperature differences. This effect is termed "reticulation."

Tray Development of N-G Film and Premo Film Pack Films at Temperatures up to 75° F. (24° C.)

Up to a temperature of 75° F. (24° C.), the regular instructions for development should be followed, modifying the time of development accordingly. If an acid fixing bath is employed containing an excess of liquid hardener, it is possible to exceed this temperature, though pinholes are liable to form in the film, owing to a liberation of gas within the film by the action of the acid in the fixing bath on the sulphite and carbonate in the developer absorbed by the film.

A Simple Method of Obtaining a Supply of Cool Water

A supply of cool water may be prepared by taking advantage of the method used by natives of India and South America, who obtain cool water by storing the water in a porous earthenware crock in the shade, or by covering the vessel with flannel so that the edge of the flannel dips over the sides and into the vessel. The water is thus absorbed over the entire surface of the flannel, and in this way a large evaporating

¹ Courtesy Eastman Kodak Co.

surface is maintained. The use of a canvas, self-cooling water-bag will also afford a satisfactory way of obtaining a supply of cool water. Such bags can be purchased from dealers handling sporting goods. With a supply of such cooled water it is a simple matter to cool the developer and fixing baths. After fixing, three successive immersions of five minutes in clean water will eliminate most of the hypo, though if absolute permanency is required, the film should be thoroughly washed at a later date when plenty of cool water is available.

Most workers will find it more convenient to work at the prevailing temperatures without the inconvenience of cooling the solutions as follows:

Tray Development of N-G Film, and Premo Film Pack Films at Temperatures up to 85° F. (29° C.)

Prepare the developer and fixing bath as follows:

Developer

Dissolve the contents of one tube of the Eastman Tropical Developer in 4 oz. (240 ml.) of water. The developer is then ready for use.

Fixing Bath

	Avoirdupois.	Metric.
Нуро	7 oz.	200 gm.
E. K. Co. sulphite		
of soda	1 oz. 175 gr.	40 gm.
Chrome alum	2 oz. 350 gr.	80 gm.
Acetic acid (28 per		_
cent.)	150 min.	10 c.c.
Water to	32 oz.	1 liter

Dissolve the sulphite and chrome alum together and add to the hypo solution, finally adding the acetic acid.

Developing.

Before commencing development it is important to bring all solutions as nearly as possible to the same temperature, it being most convenient generally to bring all solutions to the temperature of the wash water. If there is an abundance of wash water it is a simple matter to place the developer and fixing trays in a larger tray through which the wash water is circulating. The film should then be developed in the ordinary way, for the time given by the following table:

		velopment.
Temperature.	N. C. film.	Film packs.
75° F. (24° C.)	$4\frac{1}{2}$ min.	$6\frac{1}{2}$ min.
80° F. (26° C.)	4 min.	6 min.
85° F. (29° C.)	$3\frac{1}{2}$ min.	$5\frac{1}{2}$ min.

At the above temperatures it is also possible to use the Eastman Special Tube Developer if 12 drops of a 10 per cent. solution of potassium bromide are added to prevent fog, likewise the Eastman Pyro Tube developer made up twice the usual strength. The results obtained with these developers at the higher temperatures named are not so good as those given by the tropical developer, while the pyro oxidizes rapidly and has a tendency to produce stain.

Fixing

The secret of developing film at high temperatures lies in preventing any abnormal swelling of the film before hardening in the fixing bath, otherwise if the film once becomes swollen, subsequent hardening will not reduce the swelling, and after washing the film will dry very slowly. After developing for the time stated, rinse the film for not more than two or three seconds and place in the fixing bath, taking care to move the film around during the first few minutes. If the time of rinsing is prolonged further than the time stated, the gelatin film is liable to soften.

Washing

After thoroughly fixing for about five minutes, wash for ten to fifteen minutes. If running water is not available immerse in a pail of water for five minutes; a third immersion in clean water will complete the washing.

Drying

Drying should be conducted in as cool a place as possible and may be hastened by means of a fan.

Life of the Fixing Bath

The chrome alum bath keeps well and under ordinary conditions one gallon will fix the equivalent of 30 rolls of 10 exposure 3A film. Normally, the bath is slightly acid, in which conditions it is stable though the bath will also keep well when slightly alkaline. If, however, the alkali in the bath exceeds a certain amount, by reason of the addition of an excess of sodium carbonate carried over from developer by the film, a green sludge will precipitate, which renders the bath useless, and it should be thrown away. It is important, therefore, to rinse all film after developing, though the time for this should not exceed two or three seconds for reasons stated above. The quantity of acid present in the fixing bath, however, is calculated to compensate for any alkali carried over in this manner, though if too great a quantity of acid is present it will cause reticulation and blisters.

Tray Development of N-G Film, and Premo Film Pack Films at Temperatures up to 95° F. (35° C.)

Film may be developed at temperatures up to $85\,^{\circ}$ F. $(29\,^{\circ}$ C.), by the foregoing method, but if the temperature exceeds $85\,^{\circ}$ F. $(29\,^{\circ}$ C.), to any appreciable extent, reticulation of the film occurs in the fixing bath and wash water. By the use of a hypo-formalin fixing bath, however, excellent results may be secured at temperatures up to $95\,^{\circ}$ F. $(35\,^{\circ}$ C.)

Development

After seeing that the temperature of the developer, fixing bath and wash water are the same, develop in the Eastman Tropical developer for the time stated below.

m .	Time of de	
Temperature.	N. C. nim.	Film packs.
85° F. (29° C.)	$3\frac{1}{2}$ min.	$5\frac{1}{2}$ min.
90° F. (32.2° C.)	$2\frac{1}{2}$ min.	4 min.
95° F. (35° C.)	$1\frac{1}{2}$ min.	$2\frac{1}{2}$ min.

Rinse for one or two seconds only and transfer to the following fixing bath:

Fixing Bath

	Avoirdupois.				
Hypo :	9	oz.	250 gm.		
E. K. Co. sulphite of			Ü		
soda	1	oz. 350 gr.	50 gm		
Formalin (formalde	e-				
hyde)	$4\frac{1}{4}$	OZ.	125 c.c.		
Water to	32	OZ.	1 liter		

First dissolve the hypo, then the sulphite, and

finally add the formalin.

The fixing solution should be held in a container fitted with a lid and kept closed as much as possible, otherwise, the fumes of formalin are apt to prove very irritating.

This bath keeps well, and although a slight milky precipitate may form, it will do no harm. However, as soon as the bath shows signs of exhaustion, it should be thrown away.

Washing and Drying

Wash in two or three changes of water for ten minutes and dry as usual.

Tropical Tank Development of N-G Film and Premo Film Pack Films

So far no satisfactory method for developing film in the Kodak Film Tank or the Premo Film Pack Tank at the temperatures stated has been devised.

Tropical Development of Plates

The foregoing instructions apply equally well to the development of glass plates, though at a temperature of 95° F. (35° C.), if the plates are lifted to and from the various solutions by means of the fingers, the film is apt to become separated from the glass at the edges, causing frilling. If the plates are held in a suitable metal rack (the Core Plate Developing Rack) and not removed from the same until after leaving the wash water, no trouble in this respect will be encountered.

Tropical Development of Velox and Azo Papers

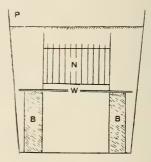
In view of the fact that the gelatin coating of Velox, Azo, and other developing-out papers is so resistive to temperature that it is barely soluble in boiling water, very little trouble is experienced in the tropics. However, when using Nepera Solution, or the Eastman Special Developer with the addition of 0.2 gram potassium bromide per liter, it is advisable to rinse for a few seconds in a 3 per cent. acetic acid stop bath, and use a fixing bath containing twice the usual amount, namely, 10 per cent. of Velox Liquid Hardener.

Importance of Developing Film Exposed in the Tropics Immediately after Exposure

Develop film which has been exposed and kept at tropical temperatures as soon as possible after exposure, otherwise there may be a loss of density, and on developing, the film may assume a mottled appearance. If the film is new, this is not so likely to occur but in the case of film which is, say, six to twelve months old, it is advisable not to delay development for more than one or two days. In all cases, especially if the film has been exposed to sea air, it is advisable to develop film at the earliest possible opportunity.

Washing Negatives in Camp

In a military camp and other places where the photographer cannot make use of running water as he would wish, numerous "fakes" are used for washing negatives, but under primitive conditions negatives are rarely freed from hypo as thoroughly as they should be. A fact which might always be borne in mind is that hypo solution is heavier than fresh water, and that when properly placed in water a negative may be made free from hypo very quickly. Running water is by no means necessary to wash a negative—it is a great convenience, of course—as by placing a newly fixed plate upside down or in a vertical position in the water, and, what is most important in such a way as to have plenty of water beneath



it, it is possible to wash well in a bucket of water, which is completely changed several times. The accompanying sketch shows a satisfactory plan for washing in a bucket or bath of still water. P represents a sectional view of the pail; in it two bricks (B,B) are placed endwise, and on the top of them a piece of close-mesh wire (W), or perforated zinc. On this "shelf" the negatives (N) are placed in a vertical position, as a commercial rack takes them, enough water being placed in the pail to cover the negatives completely. Thus the negatives are made to stand above a good volume of water. About four or five soakings, each of five minutes, will free a rack of a dozen negatives from hypo.— $British\ Journal\ of\ Photography$.

The Mhotographic Journal



of America

Published Monthly Mith Illustrations

Cyko Conserves Labor

THE RESULTS of our recent trial of Cyko Paper," writes Mr. H. A. Reedy, of the Artcraft Photo Company, of St. Paul, Minn., "proved that our printers could make a third more prints in a nine-hour day than with the other standard paper. This means that in one year four printers could accomplish as much as six had previously done."

Cyko Conserves Electric Current

"IT WAS ALSO NECESSARY to reduce the wattage of the lamps, and this, together with the speed of the paper, meant much less electricity used. In this period of labor scarcity the financial saving should not be the only consideration. I do not, however, allow anything for the worry saved me in meeting my labor needs."

Cyko Quality Satisfies

IF THE AMATEUR finisher will apply these proportions to his own costs, he will find that the price of Cyko is practically the same as that of other paper. Then if he believes as I do—that quality of work and worry about labor are worth something—he will not hesitate in making the change to Cyko Paper. As 'beauty is only skin deep' so the difference in the price of Cyko Paper is in the list price, and not in the final cost."

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THOMAS COKE WATKINS, Editor

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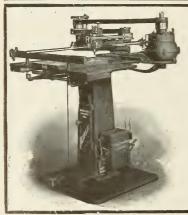


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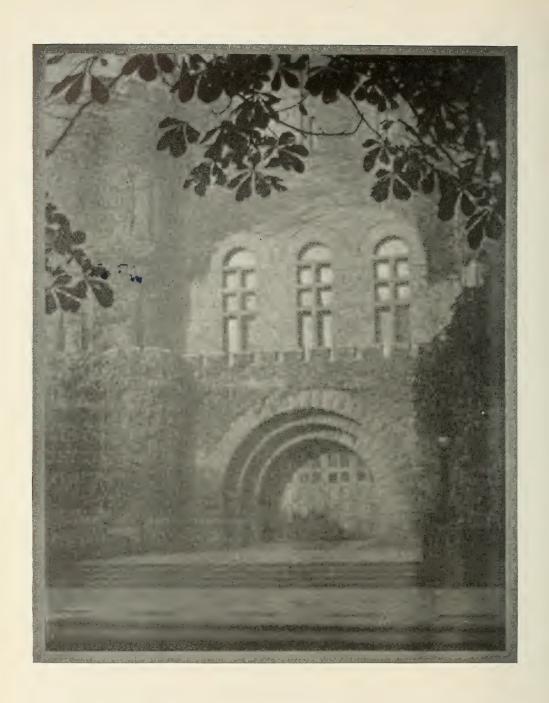
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"BROWNSTONE AND IVY BY W. H. PORTERFIELD BUFFALO, N. Y.



PHOTOCRAPHIC JOURNAL MAL MERICA

VOLUME LV

OCTOBER, 1918

NUMBER 10





HORIZONTAL BALANCE IN A PICTURE

By "PROFESSIONAL"

THE occasions in professional portraiture where special attention must needs be given to the subject of horizontal balance appear to the writer when compared to that of vertical to be rather infrequent. To the landscapist, however, this is a frequently occurring point, and often demands attention. In his case the attainment of this balance is greatly aided, while bending his efforts toward securing aërial perspective and atmosphere. Take a landscape, for instance, where the negative is bold, brilliant and sharp (a much desired effect with the ordinary view photographer), and in the result, especially if there be much sky, you will find a picture not only lacking in horizontal balance, but also in perspective and atmosphere. This is because the latter part of the picture is either too heavy or the mass of white in the sky is so strong as to overbalance it, while no sense of distance is felt, for the intensity and brilliancy of the negative have obliterated all delicacy of

depth. The blank sky way down to the horizon also lacks interest.

The Modern Landscape Artist

Take another similar style of landscape made by some of the more advanced of the modern workers, and you will see that the negative, and consequently the print, is altogether different. In this case, an orthochromatic, panchromatic or similar plate on these lines has been used, and by selecting a favorable day, the sky has been photographed and noticeable atmospheric effects have been produced. The density of the plate was such that all of the fine gradations of aërial perspective were preserved which, while adding greater interest to the view, thereby enhancing its beauty, solved as above said many of the needs of a balance between the upper and lower parts of the picture. You will at once notice that in this case an artistic result may be made out of practically the same landscape.

The clouds, in a perfectly balanced picture, should, in their intensity and force, balance the general scheme in the lower part. This adjustment of the top and bottom of the landscape is one that requires attention to the fitness of things. When found in a large mass of sky, some clouds will tend to reduce its overpowering weight by attraction. Do not suppose, however, that the writer is suggesting that clouds should always be present in a picture. In nature this, of course, is not the case, and artists often paint with little or no cloud effects, but good paintings will always be seen balanced in some way, even if this be the case.

Various landscapes at certain seasons of the year, and in particular localities, are frequently lighted under conditions of atmospheric effect that produce a feeling of extreme delicacy. In such cases it is very evident that anything unlike a proper presentation of the scene would

be incorrect.

A delicately lighted landscape does not want a thunderstorm overhead, or the reverse, as some gum workers have produced. A thunderstorm may be on the way, and rightly so shown, but if it has made sufficient progress in the sky as to be especially noticeable, a corresponding shadow on the earth should show it. Those who print-in skies on their prints should, as the majority probably do, take care that the upper and lower parts of

the picture pull together.

Due consideration should be given to avoid dividing interest between two widely separated parts of a picture, such as the sky and the foreground. Some one thing should be the scheme that especially called the picture to be made. Avoid photographing nature when she is commonplace. It naturally follows that if it be a cloud effect, then that part of the picture should be so trimmed in in the print or matted that it becomes the most important, attention being drawn to it in various ways without hesitation. The land should show only as much as is necessary to give balance and not to detract interest. The reverse of this is equally true. Another thing, do not have the horizon in the exact center. It weakens the effect. Have it above or

below, according to which part of the picture is the most important, to aid in giving prominence by the larger mass. Do not think, if you have a beautiful cloud effect, and, at the same time, something so very attractive in the foreground that you can make your picture twice as attractive by working them both in of equal prominence. This is often done, and with sad results. Have them both in, if you wish, but subordinate one to the other, to an extent necessary to the attainment of a peaceful observation of your picture. Some sensitive natures much object to the disquietude produced in not seeing all the picture at a glance, even if they are successful in the end. Neither go to the other extreme and produce monotonous results. Have something dominate and the minor parts take their proper place. This is done by the selection of point of sight and certain other conditions that should govern you.

Some Suggestions

In portraiture, perhaps, a suggestion or two will serve to illustrate the manner in which horizontal balance can be obtained. This is as much by eliminating some of the more common practices

in use as in any other way.

Does it appear correct to have for the foreground a dark, heavy mass while the upper part of the picture has a very light ground? Better effect and balance may often be obtained by raising the "key" (in a measure) of the lower part of the picture to pull more with the background or by toning down the ground to produce greater harmony with the foreground? A better improvement still would be to remove the whole arrangement farther from the light, bringing all parts in tone, whereupon the marked and unpleasant contrasts would be brought nearer together.

An Interesting Experiment

Perhaps I can, to advantage, advise at this time, as well as on a future occasion, an experiment which, I trust, will be of sufficient interest and instruction to cause the reader to overlook the rather childish things suggested. Various pictorial principles will become apparent

by the experiment.

Hold up vertically, by the handle, an extra-large wooden spoon, the concave side before you. Imagine the spoon, though hollowed out, to be rectangular instead of elliptical. Now obtain a very small, full-length bisque doll (a china one should answer, but bisque is preferable) of a size proportioned to the hollow frame made by the bowl of the spoon (just as you would select some full-length picture to place in a frame that

vou wished to sell).

Taking hold of the bisque figure with a pair of pincers, experiment by holding the doll at various distances and positions inside of the outer edge of the spoon. Station yourself rather away from the skylight in doing this in order to get the whole thing "in tone," that is, to lessen marked contrasts as you would pose your subject under the light. Place it close to the bowl and then a little farther away. higher up and then lower, and finally outside the edge of the spoon, all the while studying the various effects produced. The effect of light and shade and its many changes in turning the figure and spoon away from the direct light as well as toward it and bringing it to different parts of the room will give much valuable information on light and shade, in "high" and "low key" effects of relief from and sinking in the ground, values, etc. You will also notice how to obtain tonal qualities and to lose them just as easily by going to different parts of the room, etc.

When the doll is well back into the hollow of the spoon you will find that you can have the figure "tied" to the background and yet not glued to it in appearance, and will note also how little is the relief necessary to accomplish this.

The rotundity of the groundwork of the spoon, curving both ways, although proportionately very far in excess of what we should employ, will offer at least for our consideration a suggestion that we may well bear in mind, viz., To obtain in our results better balance between these two extreme ends by having them recede as they go into the picture, coming together at that point where we wish to produce the greatest distance.

Aërial Perspective as an Aid in Obtaining Horizontal Balance

The method just described will give us aërial perspective in a full-length portrait of one or several figures, and, as in landscape work, this perspective will greatly assist in easily obtaining the principle of horizontal balance. Bear in mind the importance of properly lighting your foreground and the various parts of your background to obtain this distance and balance. At the same time keep in mind the fact that the figure should melt in with the ground at certain places, but not in all parts, and, perhaps, by the use of judicious unobtrusive accessories carry out the idea that both the foreground and background are necessary to the figure, and vice versa, and that they both belong there. Successful handling will be facilitated by placing the subject and background away from the strong light, the arrangement thus being kept in tone. Avoid having the figure so lighted that one part melts into the background while another appears to be in a widely different plane of perspective. Correct handling in this particular will ordinarily show a distance of from one to two feet in the plane of perspective, while incorrect handling may exaggerate this to eight or ten feet. Let every composition be governed by correct anatomy and common-sense, avoiding extremes of pictorial principles. This is a good rock to anchor to and has awakened many of us to the tremendous importance of the "stay qualities and the controlling influence they possess in properly expressing various characteristics of a sitter. Those who desire to become acquainted with and to perfect themselves in this matter should give due consideration to the balance of the top and lower part of the picture as well as to the extreme sides. even when it mostly refers to the matter of the ground, in front, behind and above the sitter.

This aërial perspective not only helps in securing horizontal balance between the two extreme ends of a vertical picture or horizontal one, for that matter, but, as above noted, it plays an important part in securing the feeling that the figure is

a part with the background and not detached from it. A sufficient feeling of relief is obtained, and the solidity of the subjects is seen, without bringing them so far under the light to obtain it that complete separation of the ground and figure results. The natural effect of thus lighting the ground to obtain the above also aids in producing the horizontal balance in the subject itself, in so far as this may be aided by the lighting alone. We do not think it necessary, after what has been said on this subject in this paper, to do more than remind the reader that while looking after the attainment of the vertical balance referred to in the July issue of this MAGAZINE, occasions may occur when the figure itself needs attention to carry out the correct horizontal balance. This, however, deals with spots or masses in various parts of the picture that we shall attempt at a future time to explain. Equipoise is often thus obtained by some needful accessory introduced mainly for this purpose.

In horizontal pictures a single figure, or a group of two or more, a little or even considerably to one side of the center, may be vertically balanced. Yet if we trim the print so that it may come nearer the center to overcome the feeling that it is too heavy on that side we may stultify the work. We might, however, have made it far more attractive and a work of greater magnitude if in the making of it we had arranged the other side so that this mass of figures had been balanced by some spot of light or equally heavy mass of dark. This, however, should in turn possess some character-

istics of interest.

It does not take much to restore this balance when removed some little distance from the other side. If the weighty part of the group should be toward the lower part of the picture, even if abounding in some contracts of light and dark, it can be perfectly balanced by a small insignificant object on the other side, or several of various sizes, if not too attractive, and are a little lower in tone. This may be aided also, if found necessary, by a broad plane of light over a good portion of the other end of the ground, if the latter be not made so strong as to overdo

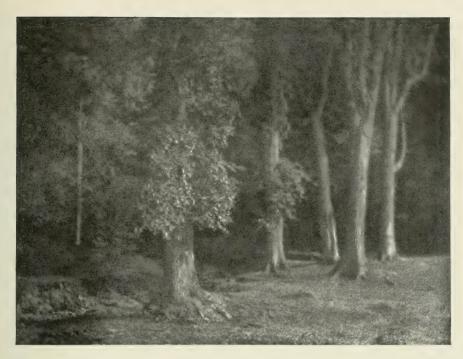
matters. This, of course, is to be

guarded against.

While speaking of these horizontal pictures, it has occurred to the writer that it would be a good idea if these pictures were made more frequently than they are. With the professional photographer it seems that it is only in large groups that these pictures are produced. With the advent of the black and white grounds, and the general abolishment of painted scenery, we as a class have cut our pictures more and more narrow. This is probably in order to get rid of the overpowering effect of these characterless grounds, whether white or dark, till at the present time the modern professional workers are mainly in a state of hopelessness. We are tiring of these plain grounds, which are often too powerful in their effect, which possess at times, on account of the weight of attraction, more attention than the figure itself. We know the inappropriateness of most painted ones which very rarely fit the subject. Out of this some of the modern workers are making on their negatives grounds to fit their subjects.

The opportunities for pictorial work and our growth toward its accomplishment would increase if we were to make smaller figures in our vertical pieces. Try to obtain some character in our grounds, and also make more horizontal work, while seeing what we can do toward obtaining pictorial qualities.

As an aid toward more readily starting upon this line the writer would suggest the employment of a broken ground, i. e., with no well-defined or strongly indicated contrasts or designs. The lights in the ground should be some bit removed from white, and the very dark places rather rare; and those where they would be most needed as a base it would be comparatively easy to work in a few lights as well as medium and low-toned designs to fit the subject. This is now done by some workers, and if more generally taken up and worked out we should soon see a very decided change for the better at our convention exhibits and a general improvement for our patrons. A perfectly plain dark-red burlap ground is good, and could be worked upon just as well.



"THE STORY OF THE ELMS"

BY W. H. PORTERFIELD, BUFFALO, N. Y.

W. H. PORTERFIELD—AN APPRECIATION

By FRANCIS ORVILLE LIBBY

N the early days of photography, with a very few notable exceptions, men and women who owned cameras were quite content with the miracle which transferred, in a very literal way, not the spirit of nature to the sensitive plate and later to the paper but a more or less truthful rendition of the facts that happened to lie before the lens. These were generally very prosaic and the ambition of the photographer satisfied easily by a hard, wiry image, superficial in every way. The whole proposition in the beginning was scientific. It is no less scientific now, but photography has emerged from those early days of groping and trial and easily satisfied desire, and now in the hands of pictorialists has become a fine art, a real means to the expression of personality and the higher emotions and aspirations of the artist.

Of all the pictorial photographers of today—and there are many, men and

women, artists in all parts of the world doing most creditable work and producing pictures that will live—none excels, either in conception of subject or in execution, the work of Mr. W. H. Porterfield, of Buffalo, N. Y. A man keenly sensitive to the beautiful and with the master hand of the artist, skilled in reproducing, not a superficial copy of the scenes or subjects of his pictures but their very soul, full of poetry and imagination. Mr. Porterfield's name is known and honored wherever pictorial photography is practised and his work possesses such a part of the personality of the man as to enable one to say at once, "That is a Porterfield." Strong, virile and original, full of poetry and atmosphere, each and every one of his prints has power and a subtle quality of mystery that fascinates. Some are poetic moonlights in which the distance is bathed in a shimmering veil of beauty;



"BENDING TO THE BLAST"

BY W. H. PORTERFIELD, BUFFALO, N. Y.

others strong pictures of forest glades, mysterious and dim, the haunt of elves and goblins, such spots as one would dream King Arthur and his armored knights rode through and tarried not in the days of chivalry. Many are beautiful compositions of line, decorative effects, reminding one of Hiroshige and Hokusai, the masters of the old Japanese color print, or perhaps of the delicate silken beauty of a Kakemono, and we cannot help thinking Porterfield, like Whistler, must have studied these artists of old Japan and been to some extent influenced by them in his art. However, it is not only in the quieter harmonies of night or the beauty of a curving line that our artist excels. It would be too much to say of any man that he is without mannerisms, yet there is no sameness in Porterfield's pictures, and whether his subject is sail-boats in dock or the gently rolling tops of hills, the treatment is distinctly individual, which is as it should be, and in all his outdoor studies there is a feeling of fresh air and clean, sweet breezes. All show the strength of the man and an imagination ever alert.

Porterfield's art is not content merely to show a literal transcript of a bit of nature, however beautiful it may be, for he recognizes the value of impressionism, and when we look at a picture of his —for example, one of his latest works, entitled "Bending to the Blast," a print depicting tall trees swaying to the sweep of the storm—we see not a copy of any particular place or storm but visualize all storms, and the rush of the winds is on our faces and their tumult in our ears.

An ardent and prolific worker himself, and a consistent exhibitor at all of the best exhibitions and salons both in this country and abroad, Porterfield is ever ready and eager to assist in any pictorial enterprise and believes in sharing his knowledge generously with others, finding his greatest pleasure in helping all who are trying to make pictures with the camera.

A member of the Pittsburgh and London Salons, he has always been very active in the interests of these bodies, and has done much to raise them to the high level they now occupy as the two



"THE MAID OF THE MIST"

BY W. H. PORTERFIELD

BUFFALO, N. Y.



yearly exhibitions showing the best pictorial work of the world.

The carbon process, which Mr. Porterfield uses as a printing medium, is not only one of the oldest and most permanent known to photography, but permits the use of a wide range of color, and in the hands of an expert is acknowledged to be one of the processes most sensitive to individual treatment.

The characteristic Porterfield is usually low in key, a mysterious harmony of composition and suggested color, rather than any startling effect of light and shade, such as we sometimes see, and which gives the impresion that the maker has attempted to acquire notoriety by the use of that which is bizarre rather than endeavored to reach the heights of artistic achievement which lie only in the conscientious protrayal of the

essence of the thing, its soul, and thus to arouse the deeper and finer emotions within us.

Too many of us follow along in a rut; many faddists there are among us and we do not think and feel as deeply and sincerely as we should, being quite content if we can follow humbly in the footsteps of a master. This is not as it should be, and, wonderful as Mr. Porterfield's work is, I would suggest to no one to attempt to imitate him, except, of course, in the basic principles, common to all art, of unity, harmony and the like; but I do ask you all to study his work with open minds and thereby gain each for himself inspiration and the ambition to go forth, and, by developing your own talents, tell each your own story of the beauties of the world in which we live.

ENLARGING FOR PROFESSIONALS

By H. ESSENHIGH CORKE

TN many instances professional photographers make a rule of sending all their enlargement orders away to one of the several good trade houses who make a specialty of this work. In the case of a very great deal of enlarged portrait work this plan has a great deal to recommend it, more especially, perhaps, in portrait work, than any other. Most enlarged portraits—practically every one of them-will require in addition to the actual enlarging (which is more or less mechanical and a matter of careful technical work) a very considerable amount of "working up." calls for special skill and knowledge of a highly artistic nature, for it has to be done well, besides a good deal of time in any case, and it does undoubtedly pay the average professional to place such work in proper capable hands rather than to attempt to do it himself. Such "working up" is very different on an enlargement to the more or less simple "spotting" that most small or contact prints require, and cannot be undertaken by an ordinary assistant "spotter and finisher.'

There are many other jobs, however, that might very well be undertaken by the professional and his ordinary assistants in the way of enlarging that will not only well repay doing, but which will, in the saving of time and cost, and in the amount of odd work that will suggest itself, more than repay the moderate outlay on some form of home-enlarging apparatus. Actually, of course, there need be no outlay at all, since exceedingly good work can be turned out at home by the simple use of an old camera lens fitted up against a window, reflected daylight being the source of illuminant. The drawback to such a method is that this work must be done during the daytime, and therefore in many cases, where one would "run off" an enlargement, this must be postponed for want of time just at the moment, with the frequent result that it is put off altogether and forgotten.

I would advise, therefore, that a complete artificial-light apparatus should be installed, and that this should be as good as one's purse will allow: also that it should be fitted up completely and

permanently in some handy place, so that no preparation need be made at all before a negative can be slipped into place, light switched on and an enlargement made.

In my own case I have a half-plate enlarger fitted with an inverted incandescent gas mantle which has served me very well for some years now. It is fitted up in my dark room, where both negative developing and bromide (contact) printing are done. Enlarged negatives can thus be made at any time as easily as paper prints without the necessity of putting the exposed plate into an old plate box and running off some distance to the dark room to develop it. The actual work is, of course, so arranged that negative developing is always done at a different time from contact bromideprinting and enlarging; but with two hands working at the same time in the room one can be making contact exposures while the other can be working at the enlarger, both using the same developer and fixing, and thus making only one batch of prints for future washing, etc.

Although I have found that incandescent gas has answered well for most of the work that has come my way, yet I am inclined to think that the more modern small arc lamps made especially for enlarging would give still more scope for work: but there have been local difficulties against the installation of these in my case, not the least being that no public electric current has been available until the past few months. From what I have seen from others of my friends who have these small arc lamps in use, their chief advantage lies in the very powerful nature of the light, which makes exposures usually much shorter.

An average exposure, working with gaslight and enlarging, say, a half-plate to 12×10 on ordinary bromide paper, the lens used working at f/8, is about 15 to 30 seconds with a good average negative. The arc lamp would reduce this very much; indeed, in many cases it would reduce the exposure so much that one would not have sufficient control, so that in this case one can place a sheet of fine ground-glass between the light and the negative, which will not

only get over this trouble but will help to a very marked degree to avoid that hardness of image and that clean-cut way in which all the marks of the retouching pencil are apt to show.

It is sometimes difficult with gaslight to obtain a soft enlarged print from a negative that is inclined to be too plucky or strong in contrast. Here, again, the reserve power of the extra light of the arc lamp would be a great advantage.

These small arc lamps also make it possible to enlarge direct on to some of the more recent brands of paper that have such telling qualities, such as Cyko and Wellington.

I think, also, that when once enlarging is seriously undertaken it has a tendency to help us keep up the average good soft quality of our negatives, as it must be borne in mind that if successful enlargements are desired the first essential is a really good quality negative to work from

One other point that I would mention in favor of enlarging at home is the direct saving of time and great saving in cost of materials that will result. Given careful, good, clean work a quarter-plate negative should enlarge to at least wholeplate size without even its producer being able to detect any difference in quality in the finished print from a direct whole-plate contact print; and if this fact is remembered there will be many occasions when small plates can be used instead of larger ones, so that a really considerable saving will result. Personally, I work very much in this way for several reasons. For instance, a special customer of mine commissions me from time to time to go to his place and make for him a large number of views on his estate of very various descriptions, including ordinary landscape views, interiors, farm buildings, exterior and interior, animals, cows, horses, pigs, motor-cars (still and moving), boating scenes on the lake, prize poultry and a hundred and one other subjects, but I never can find out until I get there just what are wanted. used to be "no end of a job" to take over a 12 x 10 camera with several lenses and heavy plates, and also a great handicap, to carry this 12 x 10 right away to one

corner of the estate when I got there, and then to find I was asked to make a view of some buildings and at the same time a single picture of a pig, or a cow, or something that would not keep still. Very likely, too, I was asked to have the animal in the immediate foreground and on a large scale, and also show the distant buildings in the background sharp as well, which means stopping down so much that the animals always moved.

One day, in desperation, I pulled out my little vest-pocket camera, after having wasted six 12 x 10 plates, and made some exposures with this. These, when enlarged, proved to have solved my troubles and gave excellent results. This tiny camera, although excellent in every way, is hardly one that can be taken out on all such work, as the client will not believe that he is going to get value for his money, and now I have done a great deal of such work with a quarter-plate reflex. This looks larger and more business-like and gets me the results I want every time.

Yet even this looks small for some jobs, and although I know the results will be good, yet I have had to resort to another little trick on some kinds of work. I do a good many 10×8 groups, and so I have had a $8\frac{1}{2} \times 6\frac{1}{2}$ camera fitted to take half-plates in its dark slides, and a very great many of my recent 10×8 groups have been thus made. If the cost of half-plates and 10×8 plates be compared, these will be found a good deal in favor of the half-

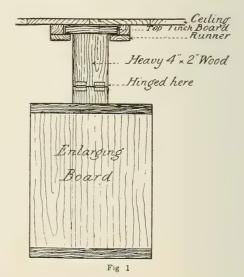
plates.

I admit that a little more care is necessary in getting only perfect quality negatives, and also that special methods of being able to run off a number of enlargements as quickly as contact prints are required; and next month I will describe and give illustrations of the methods I have devised to enable me to do this, and when I state that one day last week I was able single-handed to make one dozen each prints from seventeen different negatives, all the prints being enlarged to 10 x 8 from quarterplate negatives, in something like five hours, it will not, I think, be considered an unreasonably long time in which to

produce 204 prints, or about 40 prints an hour.

I have endeavored to show the advantage to the professional photographer of being able to make his own enlargements. I propose to explain exactly how I have had my own darkroom fitted up for this purpose and to describe one or two little methods that I have found to save a great deal of time.

I should first explain that my darkroom is a small one, smaller than I should
advise as really convenient, but this was
a matter which could not be overcome
when building. In order, therefore, to
save space I arranged that the enlarging
easel should hang down from the ceiling instead of running along the floor,
as is more usual. The enlarging lantern
stands permanently upon a bench at one
end of the room, at such a height that the
image thrown upon the easel is at a convenient height when standing by it to
work.



Two pieces of wood were fixed to the ceiling for the enlarging easel to run backward and forward upon, these being so arranged that a space of about 1 inch was left between them and the ceiling itself, which is made of matchboard. A heavy piece of wood, 4 inches by 2 inches, was then taken and the top of this planed off quite square and smooth. To this was screwed a piece of 1 inch board, extending out each side so that this would hang

over and from the runners. To this heavy piece of wood was screwed an 18 x 14 good quality drawing-board, so that the bromide paper could be easily

pinned on to it.

Fig. 1 will, perhaps, explain this better than words, but it should be stated that whereas in the sketch a distinct space is shown between the top of the running easel carrier and the ceiling, yet in reality only just sufficient space should be left to make the thing run easily along without any more play than is necessary.

The heavy piece of 4 x 2 wood was also cut very cleanly across and then hinged together as shown in the drawing, this being done so that the board could be swung up to the ceiling when not actually in use; but I have also found this movement of very great use in swinging the easel so as to correct faulty uprights in

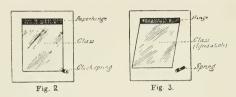
the negative.

The whole arrangement such as I have described was home-made, and for some years answered its purpose excellently; but there was always the bother of having to pin each piece of paper on to the board, and in some cases it was found very difficult to keep the paper flat, so as to obtain perfect sharpness all over the print. In order to overcome this I devised the following plan, which not only entirely overcomes this difficulty but makes the putting on of each print only a matter of a couple of seconds, thus saving a great deal of time.

A second smooth board, smaller than the actual enlarging board, was obtained, or rather made, by joining together two pieces of three-ply wood. On this was fixed a piece of smooth white cardboard. A piece of glass, $13 \times 10\frac{1}{2}$ (this for making 12×10 prints only), was then hinged to this by means of some stout art-paper and "seccotine" along its top side only.

Thus, when this is placed in an upright position the glass will naturally hang down practically flush, but in order that it may keep the paper perfectly flat and prevent it from slipping down a piece of clock spring is screwed to the wood at the right-hand bottom corner, so that it just catches over the glass.

All that then has to be done is to center the image on the easel so that it appears in the required place under the glass, then lift up the glass a few inches with the left hand while the paper is slipped into position with the right hand and the spring slipped over. Here, again, perhaps a rough sketch will help to explain. For my own use I made three



of these extra fittings, one for 12 x 10, one for 10 x 8 and one for 8 x 6 prints, each one fitted on to the same size outer boards, so they can each in turn be slipped into grooves made for them on the large board.

In the case of odd-size work, reductions in the lantern, etc., the original board is used and the paper simply pinned in position; but for ordinary work in stock sizes these simply made hinged glasses save more time than can be imagined unless actually tried in use.

Provided that suitable negatives are made, thin, clean and crisp, so that the exposure is something between 5 and 15 seconds on bromide paper, there is no reason why a dozen enlarged prints should be any more bother to make or take any more time than a dozen contact prints, and in a very great deal of my work this

is the method I adopt.

There is absolutely no loss of quality, and no expert could distinguish between an enlarged and a contact print, providing always that the negative is suitable and the degree of enlargement not excessive. For instance a whole-plate direct-contact print or a whole-plate enlargement from a good half-plate negative should look absolutely equal as regards quality, and when it comes to making, say, a dozen exposures on whole plates or a dozen on half-plates the difference in cost is considerable.

I further claim in favor of enlarging that there is more scope for personal artistic scope in enlarging, as it is so easy to shade down and print up various, portions of the negative while the exposure is being made.—British Journal of Photography.

GETTING MORE BUSINESS

III. A LITTLE CHAT ON ADVERTISING

By J. CLYDE WILSON

"YES, advertising is all right," said a well-known photographer not long ago, "for some things, but for photography I have my doubts." Advertising men say that is what every non-advertiser says. It is all right for the other fellow, but not for him.

Advertising is probably the most misunderstood force in modern business. The consumer usually pretends not to be influenced by it; the average manufacturer who has not tried it looks upon it with suspicion, and Congress and State Legislatures have been inclined to treat it contemptuously. What is the reason for this? Chiefly misunderstanding.

We have not yet come to fully realize that one of the important assets of every business is good-will. We hear of the word often without thinking of what it means. Seldom do we give it any tangible value and seriously reckon it as a possession of equal or greater value than our material assets, such as buildings, furnishings, etc. And yet without some measure of good-will the business does not exist. If you open a new studio in a strange locality you start without good-will. We commonly say you have to build the business up. What does "building the business up" mean but creating a certain definite prestige due to the public becoming acquainted with your work to the point where it trusts you and tenders you its patronage?

Now there are two ways of winning good-will: If you remain in business long enough and endeavor to give full measure for the dollar spent with you, in time you will acquire this prestige, for one patron will tell another, and this second will tell a third, until gradually nearly everyone in the community will have heard directly through someone it trusts of you. This reputation for honorable and capable dealing is what is meant by goodwill. While there is nothing so valuable as a reputation built up in this way

through years of patient effort, it costs money to wait for the public to learn of you. While one is acquiring a reputation the rent goes on just the same, coal doesn't get any cheapter and food is an every-day necessity. If you could acquire this reputation quicker by an investment of money and build up your business faster by so doing, would it not be worth while to make the investment? Advertising can be used to accomplish this end. It simply displaces this word-of-mouth publicity by which every business not using

advertising is partly built up.

Often a merchant will spend a great deal in fixtures, borrow heavily to lay in a stock of goods and then say he cannot afford to advertise. If he looked upon good-will as an asset, as valuable as the fixtures and stock, he would look upon advertising, by which it can be created, not as a current expense but as a capital investment for which would be returned the power to move his goods quickly at a saving in interest and other costs. The great difficulty about advertising is that the methods employed are not always successful, and, being an inexact art, it is pretty hard to definitely calculate results in advance. The tendency of the uninitiated is to overestimate the direct results expected. I know of one man who put five thousand dollars into a full-page ad. in a great national publication from which he got one reply when he expected six or eight thousand. He thinks it was a mistake. So do I. But the mistake was in expecting so much from one ad. His method was wrong.

People do not jump out of their shoes in their eagerness to answer an ad. Human nature is not built that way. The common tendency is to let well enough alone—to move along in the old rut. Public speakers know this well, and the next time you listen to a spellbinder just observe how many times he says

the same thing over again and again in his speech before he impresses it upon his hearers. Every time we read that "IONES'S PHOTOGRAPHS ARE KEPT AND REMEMBERED," the more impressed we become and finally one day we say to ourselves, on reading this ad., "I believe I'll get one of these pictures that are worth keeping; they must be good." So one way to advertise effectively is to advertise persistently. A small ad. run in the paper conspicuously for a long time is far more effective than a single big ad.

The tendency of human nature being to plod along in the groove of least resistance, it takes considerable power to upset this tendency. Mentally we stick to the customary ideas in much the same way. So when we want to make people act at once in response to advertising we have to resort to inducement. We have got to appeal so strongly for action the reader finds it impossible to resist and, so to speak, is aroused from his lethargy because he is going to gain in one way or another by so doing. Price bargains are the time-honored cudgels for affecting this abrupt change, but the photographer is familiar with one of the commonest and best known of these inducementagencies, the premium or free enlarge-When you send out a special ment. Christmas circular or any kind of advertising which you want direct returns from, it is not enough to just say you do fine work and to picture it; there must be an inducement in the way of a price decrease, a premium or a so-called "offer" of some kind. There is nothing illegitimate about this kind of advertising. It is thoroughly sound and sane and based upon an appreciation of natural human tendency.

A kind of advertising that is thought very well of as being especially suited to a photographer's needs is what is known as direct advertising, sometimes termed "the follow-up." This is without doubt one of the best methods the photographer can employ. It has dignity if well handled, its effect is cumulative, and, unlike newspaper advertising, the prospect receiving it gives it attention alone and not along with other competitive advertising. The attention is

for the time isolated and concentrated. Secondly, it is possible by the dress and typography of the appeal to create a certain atmosphere which tends to give the reader an instinctive impression of the sender which may easily be made to be favorable. If a booklet is sent you should use excellent materals in its make-up, a good quality of paper, delicate illustrations, so as to suggest artistry in its conception. The brochure should be phrased with care, keeping away from boastfulness and merely suggesting the work is fine by reference to the "beauty of tones that make a picture good," or the "use of gentle contrasts which was characteristic of Gainsborough." Expressions like this suggest an acquaintance with the masters and an appreciation of the best, and are worth a dozen boasts about "quality unexcelled" or "the best

pictures made in the city.'

To be thoroughly effective the followup list must be carefully selected, undelivered letters returned must be carefully checked off and new names must be added constantly. Names of customers may be included in the card files (and listing upon cards is universally recognized as the most desirable method of handling lists) but should preferably be kept apart from other prospects, or, if filed with them, identified by means of a "tab" on the card, rising above the top of the cards, by which it may be spotted at once if needed. Often it will be needed. Photographers go to great pains to preserve negatives in the hope of securing reorders but seldom remind patrons of this service. A letter occasionally to old customers, say four months after the first order was placed, if not sooner, will often bring a response. Another good plan is to circularize every customer quarterly, just to keep him or her reminded of you, thereby retaining their good-will. If you have the time to make this more or less personal, by direct reference to their sitting in some way, the recipient feels rather flattered at your recollection, and if she does not give you an order will very likely mention the matter to her friends and thereby help to establish a favorable impression of you and your methods among her acquaintances. Everyone likes to feel

they are noticed by those with whom they come into contact, and this very small thing often has far-reaching and immediate results. I have seen a former patron bring down new patrons and actually introduce them, acting as a voluntary salesman, out of sheer compliment to your sagacity in remembering her with some pleasant reference to the sitting several months previous. As someone has said, "There are no friends like business friends!"

Unquestionably advertising pays—the right kind of advertising. As a rule, persistent advertising is the best. It need not be costly, but in figuring the expenditure a plan should be devised and followed without wavering clear through to the end. Spasmodic advertising, unless of the inducement kind, is usually a waste of money. The most effective advertising is the kind that seeks to create permanent good-will. At first the returns from it are not liable to be felt and it sometimes takes courage to continue with it; but if persisted in

its effect will gradually begin to be feltnot with any rush—but by a constantly increasing business the cause of which it will not usually be possible to trace definitely. But that there is a healthy increase will indicate that the leaven is working. There is a temptation then to cut off this expenditure. Don't do it; instead, increase it, proportioning your expenditure scientificially to the gross year's business the twelve-month past. As business increases your appropriation will increase, and the increased advertising in turn will increase business if well invested. It takes dogged courage to enter upon an advertising campaign that is to pay, and absolute confidence in the outcome; but when it has been done intelligently a campaign of this kind proves there is no better investment a photographer can undertake. Good-will is as necessary to business success as the cameras and lenses with which you work. It is better to secure business by advertising than to pay the landlord and wait.

(To be continued)

HINTS FROM AN ARTIST'S NOTE-BOOK

To make everything in a picture equally important is to make it utterly feeble. The artist has the power of elision. The photographer has to provide a compromise. Suggestion is the art of compromise. A part doing duty for the whole.

Contrast gives emphasis; it has also to do with lines or forms crossing each other. It is strongest in the right angle

and wanting in parallel lines.

Important points in a sky line should be carefully studied, outlines standing clear of each other and not running in nearly contiguous lines. These repetitions enfeeble a picture. Compare the pulsating effect of a papered wall when the light on it is concentrated to a particular area and the rest more or less in comparative shadow. With the same subject in open daylight you have simply a pattern.

Balance should govern masses and

keep them within the precincts of harmony. It regulates proportion, which, in its turn, lends itself to beauty.

The faculty of placing an artistic mean between two or more existing elements constitutes much of the art sense of the artist.

Figures or objects placed at the cardinal points of a picture—said to be the thirds, fifths and sevenths—acquire

emphasis.

Of light and shade it would be impossible to speak within the scope of a paper like this, but a contrasted instance may go some way in explaining extremes.

A single portrait subject under a bright sky. A photograph taken without any attempt to regulate the light will be flat and insipid.

The photographer may revel in this depicting of mystery if he but under-

stand it and feel its presence.



BY FREDERICK POHLE

BUFFALO, N. Y.

LOOKING AHEAD IN PHOTOGRAPHY

By H. D. JONES

N Kipling's story of the American who was captured by the British in the Boer War the most astonishing thing about the English leaders was their propensity to think about a century or so ahead of the game. All they did was done with a view to its effect on generations to come. There was some such sentiment expressed in the school primers, when the aged man who was planting an apple tree was asked why he should take so much trouble, as he was sure to be gathered to his fathers long before the tree could bear fruit. His reply was that he was planting for future generations, as past generations had planted for him.

Which leads up to the subject of this screed, and is intended to suggest to photographers some ideas that will be more profitable than the slap-stick methods that we are apt to favor in this age of hustle in haste and regret at leisure.

It will be conceded, I suppose, that the most profitable field for the portrait photographer lies in the direction of that sentiment that is proverbially said to make the world go round; the realm where Cupid holds court. Beginning, then, with the initial stage of that attractive little god's field of endeavor, let us consider the engaged couple as a source of revenue to the camera man.

Now bear in mind I am still keeping uppermost in this argument the thought expressed in the opening paragraph, namely, that a business man should build his business with a view to con-

tinued business for years to come and not for any hand-to-mouth business. Therefore, I begin with the engaged

couple.

Recently I received a letter from the publishers of the directory of one of our largest cities offering to give me a list of engaged couples in my town as soon as the engagement was arranged. I don't know how they propose to get the information. Possibly they have no better source than the announcements in the daily papers, which are open to any one who reads. It can be taken for granted, however, that there are ways of getting the names of engaged couples as soon as they are mutually agreed to marry.

Get after these couples with your most attractive samples, for they are the cream of future business. The average engaged couple are quite willing to spread the fact abroad, and how better and how more gracefully can this be done than by the medium of a photograph showing the handsome young man and the sweet-looking girl beaming with happiness over the fact that each has

found an affinity.

This engaged photograph is the first stage. Get them to promise, when you have thoroughly pleased them with the engaged photograph, that they will tell you when the marriage day is chosen. Then your course is plain. Keep that date noted in your diary and be on hand

for the wedding pictures.

Nowadays the up-to-date photographer is on hand at the house of the bride, ready when she is ready to photograph her in the bridal dress. It is far better to make these pictures in the home. First, she is full of the sweetness of the occasion and looks much better than she may a month or so later, even if she keeps her promise to come to the studio to be photographed. Besides, from my experience with this sort of thing, I am satisfied that this promise can rarely be relied upon. They don't like to dress up in the bridal regalia long after the wedding. Some think it is bad luck. Anyway they seldom do it. Make the pictures on the day of the wedding and make them at the residence, with the costume new and right and not crushed and torn as it may be

later. Also, you have the great advantage of making the pictures with the proper setting. Instead of an artificial background you have the correct fitting of the florist's work to support your

picture.

Then comes the bridal party. Get the bridesmaids and ushers in a group, with bride and bridegroom in the center. If there is time and opportunity, photograph the bridesmaids separately. They are always at their prettiest on these occasions and there will be sure sales. If it is warm and balmy outdoors make the pictures in the open. Study the surroundings and select a pretty corner for the posing.

Rest assured that wedding pictures, provided they are all right pictorially, will be an encouraging addition to your profits. They cannot get the same people together again for a photograph, and there will be none of the discouragement of a second sitting simply because Uncle John or Aunt Sue doesn't like the expression of a left eye or the pose of a

right ear.

So from engagement to marriage. Then comes the best of all, the baby photograph. Keep tabs on the married couples you have photographed and any you have not photographed, and in due time you will have another picture-taking job. Babies are coming into fashion again, despite the campaign of the birth-control agitators. With the baby photograph made you may still consult your diary for future business. Keep a careful note of the birthday of the baby. The idea is growing in popularity of having a baby photographed at various stages of his little life. Some mothers want him photographed every birthday, to keep a record of his growing tendencies. If they have not thought about this, suggest it to them. When you get a sufficient number of baby birthday anniversaries on your register you can almost run your studio on this branch of the business.

To carry the idea of the opening paragraph to infinity the baby will some day grow up and have babies of its own, and then you or your own grown-up baby can continue the picture-taking until Gabriel's trumpet blows and our troubles

are over.

Then there are the hotel events. Your date book can be used profitably for this purpose. Presumably you are of the upto-the-minute variety of photographer who grabs a flying dollar wherever it wings its glittering way. Then you will be equipped to take small masquerade groups at night, either with a smokeless flash bag or two, or with some one of the many artificial means of lighting on the market. If you are not equipped for this sort of work, look around next time you go to the stock house and see how cheaply and easily you can add this new department to your business.

Masquerade parties are the best from a photographic viewpoint. All the guests at these affairs have spent time and money on their costume and a group picture is always a good seller. Public dinners are a little overdone, but if you have the knack, or can acquire the knack, of picking out the likely ones and passing up the "lemons" you will find it to your advantage to keep track of these

events.

How can you keep track of them? By notifying the hotel proprietor that you are in line for this kind of business. Give him prints of the picture you take in his hotel and he will be glad to provide you with a list of the coming events in party or dinner line. If the work is done right you will in time become the

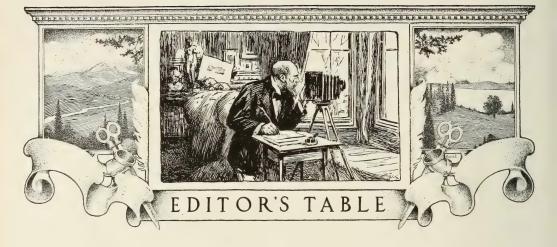
recognized official photographer of that hotel and will be phoned for whenever anything is coming off that suggests a

photograph.

Visitors from out of town provide a good field for the canvasser for your studio. When a man is in a strange town he frequently finds time hang heavily on his hands. He may have come for just one business meeting and cannot make a train back for some time, or perhaps he has slipped up on his appointment and is forced to wait for his man to come to the office. Anyway, there are always a bunch of hangers-on at hotels who do not know what to do with a few hours or days of time. These men would never be at leisure to sit for a picture in their home town, but now they are ripe for anything that looks like killing off some side line of business that they have not been able to attend to at home. Friend or wife has probably been urging them for months or for years to have a picture taken. They never had time. Now they have nothing but time. The hotel register gives you their name and city. Follow them up and get them to come to the studio.

If they won't come, go to them. Every one is doing it. Home sittings are the fashion nowadays. That elusive dollar simply must not be permitted to get away.

THE GREAT HIGHROAD OF HUMAN WELFARE LIES ALONG THE OLD HIGHWAY OF STEAD-FAST WELL-DOING; AND THEY WHO ARE THE MOST PERSISTENT, AND WORK IN THE TRUEST SPIRIT, WILL INVARIABLY BE THE MOST SUCCESSFUL; SUCCESS TREADS ON THE HEELS OF EVERY RIGHT EFFORT.—S. Smiles.



ANNOUNCEMENT

T is a source of deep regret to the Editor of The Journal that it is necessary to increase the subscription price of the magazine, but we know that this step has been delayed longer than the advance in paper prices and higher cost of labor have really warranted.

Advance notice of this increase is being given to permit our readers to extend their subscriptions at the old rate, provided they do so immediately. Be sure to read the full details on another

page of this issue.

We have been confronted with a problem which is well known to most of our readers—a problem which has only two solutions: Either to lower the high standard of the JOURNAL and maintain the present price, or to raise the price of the magazine slightly and continue its present high standard.

As we have elaborate and earnest plans toward making the JOURNAL still better, more helpful and a more attractive magazine than ever, the publishers have decided on the latter solution and beginning with January 1, 1919, the subscription price will be two dollars.

In these stirring, changeful times, when our resources are drawn upon to the utmost for the sound conduct of business, the importance of an authoritative guide is vital to every photographer.

QUALITY AND DEFINITION

THE photographer who would make portraits that are to be more than mere maps of individuals must be more than a master of lighting and posing—a lay figure can be lighted and posed and its portrait can be made, but let the photographer light and pose ever so wisely, he cannot charm the wooden expression from the wooden face.

How many of the "lay-figure" variety of photographs do we see in show-cases and reception-rooms? If the truth be told, they predominate. Pleasing pictures, and quite recognizable by friends and relatives. How long would a stranger gaze upon one of them? Three, five or ten seconds—long enough, perhaps, to take in a few details that might be brought out, then on to the next. Here and there we walk into a studio and see some portraits that are portraits. They compel our attention and admiration. We lay them down only to take them up again and again. We instinctively feel that we are looking at a personality. We see consciousness, character and will.

Why are these so few and far between? We can almost count on our fingers the studios where we know we can find them. The reason is a simple one. The photographer has lighted and posed but has failed to arouse any interest in the sitter beyond the point of looking pleasant.

The main aim of all photography, which is not undertaken for purely diagrammatic purposes, is to portray on a flat surface an object which possesses length, breadth and thickness should never be forgotten; and the quality of the definition in the various planes of the picture can be made to play an important part in producing an appearance of solidarity. The eye, attracted first by the sharpest area of definition, may roam over the whole photograph, but will return again and again to the clearest part. If the whole is evenly defined there will be no rest for the eye, and the interest which, but for the fact that all is sharp, might have been riveted upon some salient feature will be dissipated. Comparison between the "regulation" vignetted bust of some years back and a photograph by a modern artistic worker will emphasize the point. In the former case, whether it be the carefully arranged curl on the forehead of the sitter or the fifth waistcoat button, the definition will be so equal and brilliant throughout that one is tempted to think that the photograph is intended for a fashion plate to show the latest cut of waistcoat or the newest method of hairdressing. At best the result will be but a travesty and destroy all traces of personality. Now, consider a second photograph, that of a man past the prime of life, with iron-gray hair and furrowed brow; notice the gleam of light on the hair, the softly marked wrinkles telling of a life almost lived out. These have not been carefully removed by the soulless retoucher; the shoulders are softly defined, sufficiently so to suggest the stoop, while the oldfashioned stock, hardly discernible, forms a mere accessory to complete the picture. The quality of definition is soft,

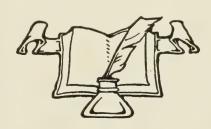
yet equal over the different planes of the head, the nose and chin are not unduly large, or the forehead dwarfed by the use of a short focus lens.

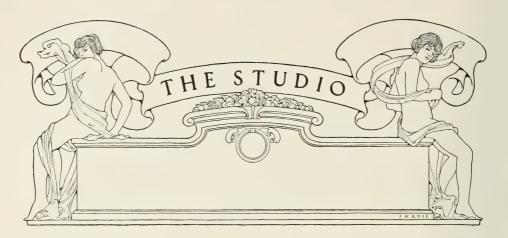
To get beyond the looking-pleasant point then there must be some sympathy, some chord of interest between the sitter and the photographer. As one of our leading portraitists remarked to the writer as he sat for his portrait, "I can only take you as I see you." Therefore any lack of interest or sympathy between sitter and worker will result

in an uninteresting portrait.

The more general knowledge the photographer has the more subjects he can intelligently and interestingly talk upon, the more often is he going to get a portrait that is worth the name. There are a thousand and one subjects to choose from, any one of which is liable to stir your sitters to varying degrees of interest and enthusiasm-you know and feel what he knows and feels on the same subject. You feel that you are on common ground. He soon loses all self-consciousness and forgets the real object of his visit to the studio, and the result is a portrait that is very much more than a mere contour map of the face.

The photographer today needs more culture, more of that broad general knowledge that will enable him to meet and talk with all sorts and conditions of men; that will enable him to take up a thread of conversation and hold the interest of his sitter. A superficial knowledge is not enough and may lead to pitfalls and a rapid decline of interest on the part of the sitter. The result will be the "lay figure" portrait. But given a subject of interest common to sitter and photographer, it is an easy matter to secure a characteristic portrait.





PRACTICAL PAPERS ON STUDIO WORK AND METHODS

Cash and the Camera

To make the camera pay its own way is the desire of many, and for some an imperative necessity. To all except the affluent the continuous increase in price of all materials is a very serious consideration.

There are a number of ways in which the amateur can recoup himself, but probably the most attractive and at the same time difficult of these is by selling prints to the illustrated

papers.

The man who wishes to obtain a regular, if small, income from this source must make a systematic study of the requirements of the individual papers to which he intends to offer his goods, and he will need a sort of sporting patience and a sense of humor, or else the regrets of the editor will be often discouraging.

On ethical grounds the amateur should not compete too vigorously against men whose livelihood depends upon their success, and in addition, especially if his time be limited, he is liable to lower his view-point, and consider pictures only

according to their cash value.

Even from this stand-point purely topical work is hardly worth while, but there are often opportunities of getting important pictures when the question of competition is quite absent, and there is no reason why the most should not be made of much opportunities.

The man who makes a constant companion of a high-class vest-pocket camera can often secure salable pictures, but systematic topical press work is impossible for many, and only the city man can hope for any reasonable success.

The country man, however, is in a better

position as regards fancy pictures, and studies of child life and animals have a good sale with certain classes of weekly and monthly magazines, and much of this work is done by amateurs.

There are a number of other ways of making the camera pay by executing small commissions from time to time for friends or acquaintances, and we may briefly consider these.

The worker in country districts, especially is

often requested to photograph silver, china, and other objets d'art, or to make copies of photographs of departed friends, as well as to record interesting local events. General portraiture, groups of local athletic teams, and animal photography are within his scope, and quite a lucrative field for spare time occupation can often be opened up.

All commissions of such nature should be accepted if the remuneration is reasonable and adequate. Only the very best work should be done, special attention being given to finish, and the prints delivered without unnecessary delay.

The quality of work is an important factor in getting a clientèle, and the highest standard should be maintained, as one commission often leads to

another.

If the work is viewed in this light it will prove of great educational value, and conduce to a marked improvement in technic and quality of

The question of price to be paid is important in several ways. To set a low estimate upon the value of the work is to induce others to do the same, and will in this way defeat its own object. On the other hand, a high figure may stifle trade.

When the cost of materials has been taken into account, time, and, where necessary, travelling expenses and a reasonable profit added, no possible objection can be taken.

All commissions obviously designed to get work done at a low rate should be avoided, as this is only fair to the professional, who may at some

future date be called in for the same kind of work. The use of photographs for advertisement is continually increasing, and this is well worthy of study on the part of the spare time worker, who should possess the faculty of storytelling by pictures, and the knowledge of how to make the story interesting, and—most important of all have the assistance of enthusiastic and pretty models.

Photographs for book and catalogue illustration are more specialized extensions of this branch, and call for a thorough knowledge of the

subjects to be portrayed.

The technical quality of all work intended for sale must be irreproachable, and no pains should be spared to this end. In many cases the worker will have to redesign his workroom with a view to increased efficiency and elimination of unnecessary labor, with, at the same time, a more uniform quality of production.

A strictly business attitude should be adopted, and a systematic study of the requirements of possible clients is essential to success, as well as the capacity to meet those requirements.

In conclusion, the pictorial side should by no means be neglected, as there is ample scope for individual expression in illustration work even of a purely utilitarian nature, and this is where the spare-time worker can score over the harassed professional, who in his multitudinous duties often has to cut his coat according to his cloth. It is only by keeping a high ideal that distinctive work can be accomplished.—Amateur Photographer.

The Style of Thing

WHEN we talk of posing and lighting and arrangement, we have fairly definite notions of what is meant by those terms, but there is another aspect of the business of portraiture which seems to have no particular name. Is there a term that implies the manner of dealing with the subject; for example whether the sitter is indoors or out, sitting or standing; whether there is a background or not, whether the figure in the manner of its presentment is ceremonial or homely or pictorial? All matters of this sort seem to require a comprehensive term to denote them. I know of none but "style" and that means also something entirely different. "styles" to the sitter, certainly, and the sitter, rendered enthusiastic by the contemplation of this embarrassing richness of choice, finally decides on this style or that. It seems, therefore, that for want of a better we must carry on with this most misleading word when we wish simply to direct attention to the manner in which the sitter may be presented. But we should be on our guard as to the difference in meaning when we use the term in such contents as "What style of thing do you prefer?" and "There is a fine sense of style in this portrait.

When referring recently to the influence of the amateur, I had in mind the aspect of the case which is described in the title of this essay as "the style of thing." For reasons already touched upon in the previous article there seems to be foundation for the thought that professional work, smart, direct and efficient as it is in many respects, is nevertheless a little samely. Styles are introduced and, if they prove successful, are rather done to death by everybody else who wishes to be in the running. A man has to be particularly talented to hit upon something which he can do with success, but which others cannot copy.

The pioneer must risk the misfortune of finding competitors on his trail and must keep ahead of them. In the homely variety of work he will perhaps find most opportunities for new ideas. The ceremonial portrait is necessarily formal and stately. It is inseparable from armchairs and

footstools and court dress and academic robes, to say nothing of regalia, decorations and pillars and curtains. But the portrait of a man, woman or child in private life opens the door to countless ways and means. And, it must be said, the amateur has already passed through this door.

But the amateur has not always kept a hold on artistic taste. It is easy to do all sorts of silly things with a camera and the sillier they are, the newer they will look by contrast with the thing we have been used to. There is no artistic virtue in taking a portrait of man staanding on his head, or to photograph him stark naked. Yet the amateur has attempted both. Such resources are a little *too* homely.

What the amateur has never perfectly grasped is the fact that the sitter must appear to be doing something which is natural and ordinary, and this defect has robbed his efforts of everything except a laughable or contemptible characteristic. The professional man is in no such danger. He can make his sitters read, write, smoke, chat, play musical instruments, take tea in couples or otherwise employ themselves in some every day occupation; and he can do so with no trouble at all, if he will only break away from his cut and dried and well-tried "knock-'em-off" style

By the way, would not the word *entourage* answer for the term wanted to indicate the style of thing?

of entourage.

In painting there are plentiful examples of equestrian portraits. How is it there are so few in photography? Is it not because the operator will not only not have the horse in the studiom but will not make an appointment with the charming equestrienne in the park neither? Officers and ladies are vulnerable on this side of their vanity and one or two fine and striking specimens would possibly induce the "hot-cakes" ease and rapidity of commissions.

Gardens and grounds seem to offer similar facilities for full-lengths or seated dolce far niente subjects. The steps of a mansion portal, a pergola, a Dutch garden with its trimmed hedges, sundials, basins and so forth; are these not more conducive to natural and sensible action and posing than the painted background which shamefacedly hints at such things only to divulge itself in the print the rotten sham that it is?

The studio and accessories; the fixed schemes of lighting and shading and the other business arrangements of the portraitist are, it is to be feared, as much hindrance as help to that moving, touching, stirring kind of portraiture which rouses enthusiasm in the sitter and his friends. The professional might go out or send out efficient operators much more than he does. So far from such methods being inimical to quality, there seems to be every likelihood that they could be made far more artistic than the usual thing.

Quite in another style, however, there is the large head or bust or half-length—a perfect studio production—which of late years has developed, in the hands of one or two men, to a high pitch of pictorial merit. But this is a subject entailing thought of posing and lighting rather than *entourage*. For the present I wish to make the attempt of getting professional por-

traitists to see eye to eye with me upon the question of freshness of idea, and I believe the two suggestions already made might be given a trial. The first by making the studio more like a room, or by actually going to the drawing-room, studies, music-rooms, and nurseries of the sitters. The second by meeting the sitters in their actual gardens, in public gardens or in parks.

I can conceive the morning or evening haze which modifies the air of London and other large towns, adding greatly to the effect of outdoor portraiture by gently veiling everything beyond the distance at which the figure stands.

The great point is that sitters must be photo graphed in their most attractive aspects in natural and ordinary occupations. They may walk, ride, pick flowers, play golf or laze: they must not do acrobatics or sit close up against blank walls, or otherwise behave like lunatics, for that is the kind of stunt beloved of the amateur who has, himself, a rockily balanced mind.

—F. C. TILNEY in *Professional Photographer*.

The Demand for Patience

In these wartime times, when universal thought seems so upset by worldwide conflict, unrest, and confusion, one will find that patience is a much greater virtue than it ever has been or probably ever will be.

To many, business today appears to be permeated with a lack of purpose, an inability to act promptly, a disinclination to follow out that

old American trait to do things.

Plans for the production of advertising are made and then held up indefinitely; big orders for printed matter are contemplated and then come unforseen complications; arrangements for a big issue of a big catalogue are completed and then the price situation demands the post-ponement of its production.

And so it goes on, day after day, until one wonders if it will ever be possible to close any big business. Right here is where we must strive to

be patient.

Because impatience won't alter conditions; won't gather in the order that is held up for some good and sufficient reason (the customer's, of course); won't overcome the consequences, requirements and far-reaching demands of a world war.

But patience will accomplish much. Therefore exercise it continuously, systematically, thoroughly.

Then it may be that you go your prospect one better—that you can *outpatience* him.

When he realizes that you are not crowding him, that you are not bothering him, that you are not impatient about the delay in securing his business, perhaps he will endeavor to roll away some of the obstacles which have been placed in your path—and his.

If you can bring about this change of attitude in his dealings with you, patience will have won, and you will be content—and your customer will wonder why he helped you to a lot of business the awarding of which had seemed to be so far

away.

Patience always was a virtue, is, and always

will be, but the present time demands an amount unlimited, that adverse conditions may be overcome, that business may be permitted to flow through the usual channels, and that harmony, peace, and happiness again may be established permanently where there is now a leaning toward inharmony, unrest, and unsettlement.

It is none too early to do your bit in this

direction!—Printing Art.

Hanging Pictures Flat

To a certain extent the variable slope forward pictures in a reception-room, corridor, or gallery introduces an irregularity which destroys to some eyes the effect of the display. This is, we think, felt most of all in a corridor, or in any rather long and somewhat narrow room where a side view of the main display is readily obtained. In such cases there is a great deal to be said for keeping the frames quite flat against the wall. There are various ways in which this may be done. One method is to use two small screweyes in the top of the frame, and to drive two small brass pins provided with heads into the wall. The frame then hangs quite vertically, and the back of it is in contact with the wall. The screw-eyes, however, are apt to detract from the effect. When the walls are matchboarded, and then covered with some decorative material, as is often the case in a studio or the corridor leading to it, pictures may be hung flat in a sort of panel by the use of glass plates. effect is not good, however, except in cases where a number of frames all the same size are to be displayed. To each of the frames-i. e., the picture frames—three glass plates must be attached, two at the bottom edge near the corners, and one at the top in the center. The lowest row must be hung first, and if there is a dado rail it may be possible to slip the glass plates at the bottom of the picture frames behind this; otherwise each picture frame must be fixed by three screws, one for each glass plate. The pictures of the second row will rest on the upper edges of their brothers of the lower row, the two glass plates slipping between the wall and the lower picture, and the single glass plate at the top being screwed to the wall. The work of hanging is thus fairly rapid, because once a start is made each picture only requires one screw to hold it in place. Nor need these screws be large, as a three-eighths screw neatly screwed home will attach a glass plate securely enough to hold the weight of an average man. Of course, such a method is only likely to be employed in cases where a display of frames will remain up for some little time. With some kinds of plaster wall the method is equally applicable, provided the pictures are of moderate size. A hole should be made in the wall by tapping a bradawl in gently, and then it will be found that a half-inch, thin screw may be screwed in, and will hold guite well. With some of the hard modern plasters we would not attempt this, however, and in any case the screw-hole will be more noticeable afterward than the hole made by a small pin or nail.

Another method, quicker than that described in the preceding paragraph, but not so readily

applicable to a close-hung panel, is more simple in execution than it is to describe. Suppose we have a frame the rebate size of which is exactly 12 x 10—that is, the outside size of glass and backboard is 12 x 10. Suppose the picture in this frame is the upright way on. Now, if we drive two small nails into the wall, both on the same level and 6 in. apart, we can hang our picture on these nails, assuming that the rebate is a deep one, as is the case with almost all the narrow beadings used for small frames nowadays. In other words, the backboard must not be flush with the back of the frame, but must be sunk, say three-eighths of an inch. But the frame so resting by its upper member on the two small nails will be in a precarious position, because it is only resting and is not held. Suppose, however, we drive the nails ten inches apart instead of six, we shall find that we cannot hang the frame on them except in this way. Hold the frame flat against the wall, with one of the nails right into the top left-hand corner. Now lift the top right-hand corner higher up the wall, covering up the second or right-hand nail; then, keeping the picture frame pressed quite flat against the wall, gently draw the right-hand side down until the picture is "straight." It will now be found quite firm, but may be taken down at any time by reversing the The handiest nails are the small brass pins sold for nailing brass picture hooks to the wall. In driving them into the wall avoid placing them with too great a distance between, or the corners of the picture frame may be forced apart, while too small a distance tends to insecurity. A tap with the hammer will often bend the nails toward each other or apart, as may be needed, and it is the heads of these special nails which hold the picture frame, and not the shanks.— British Journal of Photography.

Backgrounds and Lighting

The influence of the background in making or marring a pictorial portrait is better understood nowadays than was the case a few years ago. Both professional and amateur photographers have realized the importance of the background by practically obliterating it. This apparently anomalous statement can be better explained by saying that the simple and unobtrusive background, i. e., a plain or slightly graduated light or dark tone, is recognized as the best setting for making the portrait itself appeal to the observer. The ornate professional background is, of

course, still to be seen in the work of some of the cheaper artists of the lens, who apparently have to cater for a section of the public who like to be photographed amidst pseudo-ducal surroundings, irrespective of the costume they happen to be wearing at the moment. Whether these photographers have the strength and courage to rebel against this convention and put forward the advantages of simplicity in the background, we do not know, but we feel sure that they would greatly increase their prestige and chientele if they decided to "scrap" their ugly and sometimes impossible background cloths, and try the effect of the plain and simple tone.

In the efforts of the beginner the background is usually not considered at all, the entire attention of the photographer being concentrated on the face or figure. When the plate is developed and printed, this is noticed, if not by the worker then by his more observant friends who pose as critics—the background, resenting the lack of attention, loudly proclaims the fact. What the worker should aim at is that the background may fail to attract any attention at all when the picture is an accomplished fact. Thus the face is predominant, but this predominance is not to be secured by merely making the background a negative feature. The neutral gray or light or dark ground may be free from spottiness or strong contrasts which would be distracting, but something in the way of positive qualities is required, and without drawing attention to itself the background should emphasize the face.

One of the most valuable features that is employed successfully by many workers in their backgrounds is that it relieves the contour of the head and figure alternatively by light and dark, while in some places the outline will merge into the ground and be lost. In this way figure and background are one complete whole; a scheme of light and shade and atmosphere or a sense of space behind the subject is suggested. greatest amount of relief is obtained by having the darkest parts of the background against the lightest parts of the figure; but this method of treatment is sometimes, and for certain subjects The most important lesson the too forcible. photographer has to learn is that art is an illusion, and that to reproduce on a flat surface the rounded contours seen in a well-lit figure the background has to be definitely arranged to assist that illusion. When the sitter is observed by the two eyes of the onlooker and a certain amount of stereoscopic effect obtains, very frequently the real effect of the background is overlooked, and the resulting print seen on the flat is disappoint-There are a number of possible reasons why this is so. It may be that unobserved superfluities have become too obtrusive, or that subtleties one saw have been lost in the photographic rendering. But in many cases it is because essential features have not been emphasized.

In portraiture the power the background places in the worker's hands in this way is too often lost sight of. It is possible, although we will not say it is an easy matter, to select the background in relation to the tone of the dress, and to so arrange the lighting that awkward lines of drapery or figure are subdued or lost, while pleasing lines are more predominant. It should be obvious that a light dress against a dark ground will stand out much more boldly than a dark dress against a dark ground. Of course this may be regarded as very obvious, but, curiously enough, it is just these very obvious things which are so often overlooked by the worker who has not extensive experience.

At a recent lecture-demonstration given by Mr. R. Belfield, who has been responsible for the bulk of the new equipment of the studio, experiments were made with a model, and the amazing varieties of possible lighting were demonstrated. But one of the outstanding points that impressed us was that not only had the lighting of the model an enormous influence on the production of entirely different results,

but the importance of the tone of the background was equally marked. This tone was arrived at partly by using plain backgrounds ranging from white to black, but also by arranging the lighting so that the background was in shadow while the sitter was lighted, or vice versa, or with the background merely suggested as a half-tone by being in half shadow, arranged

by means of screens.

These alterations in tone and effect can be secured with the white background alone, and it would repay many photographers, both amateur and professional, if they could experiment on the same lines with a perfectly plain background and, say, a plaster-cast (a head-and-shoulders bust), as being a very suitable and patient model, arranging and altering the lighting of the room in which they photograph, and so securing a definite series of formulæ for lighting that could be repeated at will. An album of prints secured under such varying conditions, with definite notes as to how to exactly repeat each lighting, would be an invaluable possession for any worker who did much portraiture.—Amateur Photographer.

"Buy Now"

On every hand we have evidences of forethinking people providing against next fall and winter—in coal, clothing, household supplies, and so forth. Business men are contracting for metals, fibers, chemicals, and other essentials.

But, with the people in a buying mood, and even business men themselves also laying up, what are business men doing to ensure getting more business? Some, we know, are doing much, but who can say that it is a prevailing

characteristic?

Printed matter is the lifeblood of business, even more so than money, for it creates money; even more so than materials, for it produces the materials; even more so than transportation, for it keeps the wheels in motion. Yet it is a reasonable assumption that less than 10 per cent. of the business institutions of the country are as well stocked on printed matter (meaning everything from catalogues to stationery, and, by extension, even periodical advertising) as has been their habit, or as they should be.

Conditions today are not ideal, but they are better, perhaps, than conditions that will follow.

Business men should carefully consider whether it is not better to do business now whatever it costs than to have less business to do later at unbearably aggravated costs, with self-encouraged German commercial supremacy propaganda to contend with in addition.—The Eclipse.

Sharp Definition and How to Secure It

As every photographer knows, to obtain a critically sharp picture one must either use a small stop, which is often not possible on account of the lengthened exposure which it entails, or else must have a high quality lens and skill enough to use it. Stress should be laid upon the need for skill; since so many seem to think that definition is merely a matter of the purchase of an expensive lens. Having bought one, either

they learn to use it or they think they have been "had."

The finer the quality of the lens, the more care is required to get a sharp picture with it, since the more trifling is the deviation from the focal-plane which suffices to spoil the beautifully sharp image which it is constructed to give. The character of the surface on which the focusing is done becomes important also: as the definition which a high-class anastigmat is capable of giving is very much finer than the grain of ordinary ground

glass.

Various more or less grainless substitutes for the ground-glass focussing screen have been advocated at different times: but after trying a number of them, I have come to the conclusion that none of them are as good for the purpose as that which they are designed to replace, provided the grain of the ground-glass is fine and not, at the same time, too fine. When it is too fine it allows the image to be seen through it, as well as on it, and may become very misleading in consequence. The best way of getting a suitable screen is to make it oneself—it is not a difficult or lengthy operation, and as it has to be done in duplicate, the one job will provide a ground-glass for use and another to put by as a spare.

The materials required are two pieces of patent plate of the size needed, and some flour emery. The use of ordinary knife powder for the grinding gives a screen which is too coarse for fine focussing, but it is possible that knife powder, washed as described below for emery, would suit

as well as the latter.

The emery is put into a big bottle with plenty of cold water and well shaken up with it. The bottle is allowed to rest on the table for thirty seconds, not more, and the liquid is then poured out into another tall vessel, taking care not to pour any of the emery which has actually settled down in that time. The liquid is left in the second vessel for a quarter of an hour and is then decanted from the sediment and thrown away. It is this second lot of sediment which is required

for the grinding.

Grinding is carried out by placing one of the glasses on a board with a few tacks round it to keep it from shifting about. The heads of the tacks must be below the upper surface of the glass and the glass should not be on the board when the tacks are driven in, or it will stand a very good chance of getting broken. The wet emery powder is scattered over the glass, the second piece is brought down upon it, and the two are steadily ground together for a few minutes. Heavy pressure is not required. The emery is then rinsed off and the glasses are dried, when it will be seen whether further grinding is necessary. If there are bare spots, emery should be applied to them in particular and the grinding repeated. It does not take very long to give both glasses a very fine ground surface which is of the exact kind required for fine focussing.

Of course, no focussing screen, however fine, is of service unless it is in exact register with the plates in the dark slides, and where fine focussing is important this should not be taken for granted. Probably the best way of all to check the register is by a photographic test on such a subjet as a row of palings taken diagonally. The particular

paling on which the focussing is done should be in the middle of the plate, and should be marked. The full aperture of the lens must be used, and a plate exposed. If the paling which is sharpest in the photograph is that one which was focussed, the register may be assumed to be correct: but if one a little nearer or the reverse is sharper, then the plate is not in register with the ground-glass, and the latter should be adjusted accordingly.

When focussing it is usual to turn the pinion backward and forward, less and less each time until the position is found at which the image is sharpest. If fine definition is of the utmost importance, and the photographer cannot make quite sure when he has got it, there are two or three expedients. One is to rack *in* the camera until the image is thought to be at its sharpest, and to mark the position then. The camera is defocussed, if such a term may be used, and then racked *out* until the image once more seems sharp, and the point is marked. The actual exposure is made with the focussing adjustment midway between the two marks, if these do not coincide.

Process workers, professional copiers, and others to whom fine definition is necessary, invariably use a focussing magnifier. The best of these is a properly corrected little lens or single microscope, on an adjustable base. It is set to suit the user's vision by fixing it so that, when the base is pressed firmly on the glass side of the focussing screen, the grain of the ground-glass can be seen in sharp focus. The image can be seen also, but the grain of the screen may inter-

fere somewhat.

In order to get over this, a few fine pencil marks are made on the ground-glass in two or three different parts of the screen, and circles of thin glass, such as are used by microscopists, are cemented down over the pencil marks with Canada balsam. The balsam causes the grain of the ground-glass to vanish entirely; the glass then seems to be quite transparent, but the pencil marks remain. They are necessary, because, unless at the same time we can see through the magnifier both marks and image sharply defined, we cannot be sure that it is the real image which we have focussed. When both are simultaneously sharp, however, then we know that the image is properly focussed.

that the image is properly focussed.

If, after careful focussing, the negative is not sharp, this may be due to several causes, which must be followed up until found. The most likely is movement of the camera during exposure, a common thing in hand camera work with photographers who have not learned how to press the button correctly; or the importance, even with a shutter, of not shaking the apparatus. If the whole camera does not move, the front may do so, from not being properly clamped up or from being worn. The next possible cause is bad registration of plates and ground-glass,

already referred to, which may arise from the ground-glass being the wrong way round. Its ground side should be toward the lens, except in a very few reflex cameras, in which its proper place is ground side upward—a position much to be preferred. Another cause may be the separation of the lens from the plate getting altered accidentally after focusing—perhaps from the pull of the bellows when the rackwork is worn and works too loosely. The insertion of a color screen between the lens and the plate after focusing will also be found to throw out the focusing.

Finally the lens itself may not be properly achromatic, in which case, to secure as good definition on the negative as can be seen on the ground-glass, an alteration has to be made after focussing. There are special uncorrected lenses to which this applies, as, for example, the Dallmeyer Bergheim; but these are used for the express purpose of avoiding sharp definition, so they need only be mentioned. Unless one of them is in use, it is extremely unlikely that poor definition will be due to this cause, and unsafe to assume it until all the others have been followed up, preferably in the order in which they have just been mentioned.—Photography.

War-time Advice

If the war interferes with your business, don't give up business. Put up a fight! Your products are needed as much as ever and you are probably handicapped. Your company is an exception if the training camps have not impaired its selling organization. Sales managers all over the country are feeling this loss and finding it hard to fill vacancies in their forces.

But business must go on just the same and goods must be manufactured and sold—particularly sold. Never has the mercantile world had to hold its own with such limited forces. Never has our suggestion, "Use more printing," fitted into the business scheme better than nov.

If your selling force has been reduced in size, use more Direct-by-Mail printing. If you have been forced to put on inexperienced sales people help them with good selling pieces. If you want your salesmen to give their entire time to selling, relieve them of "missionary" work. The right kind of printing will do this. At all times salesmen should be closers. They should not be required to do all the preliminary educational work which precedes a sale. Pave the way for them to close sales: mail attractive booklets or folders ahead of them.

Your mailing pieces need not cost a great deal; and the buying public *will* respond to the right kind of advertising literature. People need your product but they must be constantly reminded of the fact.—Sunset Publishing House, in "Proof."



Chemical Costs, May, 1914, and May, 1918

INCREASE cost of chemical and materials. Here are a few of those most essential, cyanid of potassium and some others being unobtainable:

	May, 1914	May, 1918
Acetic acid, 28%, in carboys,		
per lb	\$0.03	$\$0.08\frac{1}{2}$
per lb	. 05	. 10 4
Alcohol (completely dena-		
tured), gal	. 50	1.00
Alcohol (wood), gal	. 60	1.50
Ammonium bichromate,		
Merck's, per lb.	. 60	1.20
Ammonium iodid, per lb	4.10	5.00
Cadmium bromid, per lb	1.15	3.25
Castor oil (5-lb. lots)	. 18	. 55
Copper sulphate (100-lb.		
lots), per lb	$.06\frac{1}{2}$. 12
Iron sulphate (100-lb. lots),	-	
per lb	$03\frac{3}{4}$. 051
per lb	1.00	2.00
Hydrochinon, per lb	. 85	3.00
Iodin, resublimed, per lb	3.85	4.90
Iron chlorid, crystals, per lb.	. 10	. 14
Potassium bichromate, per lb.		. 85
Potassium bromid, per lb	.45	1.70
Sodium cyanid (10-lb. lots)	. 23	.60
Potassium iodid, per lb.	3.20	4.25
Sodium sulphid (5-lb. lots)	. 25	.60
Silver nitrate, per lb.	6.30	11.25
Silver nitrate, per lb. Copper, 16 gage, 22 by 28,	0.00	11.20
per sheet	5.24	6.55
per sheet Zinc, 16 gage, 22 by 28, per	0.21	3.00
sheet	1.33	2.33
. Direct	1.00	2.00

The Gross Photo Supply Co. Occupy their Larger

Wisely anticipating the larger opportunities for after-war business, and with the usual commendable enterprise, The Gross Photo Supply Company of Toledo, Ohio, have just moved into their modern manufacturing plant, erected and adopted especially for their needs. This will enable them to greatly increase their production and further improve their output of photographic mountings.

Just a Few Things to Remember

First, that your photographic material costs you more now than it ever did before and that the chances are it will cost you more in the future than it does now; also that you are paying more for everything you buy. We mean by this everything you eat or wear, for your coal, for your light—everything is going up in price.

light—everything is going up in price.

We wish it was not so, but why not look everything square in the face. Freights are slow—labor is scarce—manufacturers are unable to

keep up with their orders.

Goods are promised on a certain date and there is no reason why they should not be ready under normal conditions, but conditions are not normal now. Promises are made very carefully after everything is taken into consideration, but it is impossible to get the goods out when expected. You will gain in money and in time if you will try and keep a stock of at least sixty days, goods in your studio.

days' goods in your studio.

There will be a demand for goods this fall, the largest demand ever made upon the photographer. Manufacturers and dealers are doing everything they can to get ready for it, but are making very little headway. What does this mean to you? Just two things: first, that you must receive more money for your portraits than you have ever received before, and second, that if you want to make portraits you must secure the material in advance.—Ohio Photo News.

The New England Convention

The twentieth Annual Convention of the Photographers' Association of New England was held August 20th to 23d in the Municipal Auditorium at Springfield, Mass. The attendance was not large, as in the old days, but, what is more important, it was full of interest and enthusiasm. Some old familiar faces were absent. The most clearly sounded notes were up-to-date studio helps and photography and the Government in Nation-wide War-work and the advantages of membership to the Photographers' Association of America. Some decidedly worth while addresses were made by Eugene Hutchinson, of Chicago; J. P. Haley, of Bridge-

port and Ryland W. Phillips, President of the National.

The picture exhibit on the whole, was excellent. The work of many of the exhibitors showed

increased strength and individuality.

The arrangements made for the comfort and convenience of those who attended were all that could be desired. President L. B. Painting was reëlected for another term and Springfield will again be the place of meeting next year.

A Timely Suggestion

September 7, 1918. Editor, Photographical Journal of America: Dear Sir: I wish to suggest the reduction of all photo mounts, especially the Art folders. This would conserve a large amount of paper and reduce the mail service several thousands of pounds per day.

Sincerely,

IRA L. HILL.

Photographic War News

Or most immediate interest this month is the full statement of the acetic acid situation. The chemical manufacturers have announced their instructions from the Government as to how and where they can supply acetic acid, and we are

glad to explain this to our readers.

The Government is in need of both the raw materials used for making acetic acid and also large quantities of the acid itself. As this is for war work, all of the non-essential industries are required to curtail their uses of acid, and in order that there may be no misunderstanding as to the amounts that may be used, the Government has classified the various industries into four distinct classes. Class I includes dyes, cellulose, laboratory work, etc., and is allowed 100 per cent. of normal requirements. Class II includes medicinal preparations, paints, etc., and is allowed 50 per cent. of normal requirements. Class III includes photography, certain dye manufactures, tanneries, etc., and is allowed 25 per cent. Class IV prohibits the use of any acetic acid for laundries, toilet preparations, soap, etc.

Our business must confine its use of acetic acid to 25 per cent. of normal requirements. We find that this statement is somewhat hazy, and we have written to the authorities to get an official interpretation of "normal requirements." Whether it means 25 per cent. of what each photographer used before the war, or whether the photographer shall use only 25 per cent. of the amount of acid called for by the formulæ in use before this order went into effect, we are not sure, but without official advice we would say that we take the opinion that the latter interpretation is proper. We advise our readers to adopt this without delay, pending an official statement.

This means that for every pound of acetic acid called for by a formula that only one-quarter of a pound be used, and other chemical, such as sodium bisulphite, be used as a substitute. Whether these two chemicals can be used together or whether the clearing and hardening bath must be made from one or the other will be discussed later. The dealers in photographic materials are pledged to cooperate with the manufacturers and the Government to get photographers to observe these rules of consumption, and while they do it willingly and gladly, let there be no misunderstanding, it is a Federal order and whether it is obeyed willingly or unwillingly, it must be obeyed, so if the photographer is restricted in his purchases he will understand why it is so. The circular closes with the follow-

ing paragraph:

You are requested to inform your customers as to the critical situation in regard to the supply of raw material for the manufacture of acetic acid, and every consumer of acetic acid is urgently requested to reduce his consumption of this chemical to a minimum, substituting other material wherever possible, as acetate of lime, which is the raw material from which acetic acid is made, is required in large quantities for the military uses of our Government and our Allies. As a matter of patriotic duty to help win the war, we urge your hearty cooperation in this matter."

As to other chemicals affected by the war, the scarcity of hyposulphite of soda should be given mention. Do not waste your hypo. Heretofore it has been the cheapest chemical in the business, and the word has been to not be stingy in the use of fresh hypo bath. In order to obtain results, the line between getting all of the work possible out of a bath and rank waste must be taken There is no need to deliver stained seriously. or improperly fixed pictures by reason of an over-worked hypo bath, but there is very powerful reason for using all the strength out of a bath before throwing it down the drain pipe. Because it has been cheap, there has been an enormous quantity of perfectly good hypo bath thrown away, which is waste of the kind that is being censured throughout the length and breadth of the country. It is the waste that the photographer can avoid in order to help the country in its time of need and while saving hypo it is also saving acetic acid.

The advance in price will help to remind us of the necessity for avoiding waste, even if our words and the appeals of the higher authorities do not. It may not come at once, but we feel sure that the saving will be learned, just as we have learned to save in dozens of other directions, and that the reductions in consumption will be felt, just as they have in wheat and sugar and other commodities. It is better to conserve before we run out than to blindly go ahead at the old pace until we find ourselves totally lacking in supplies.

This country has been wise in profiting by the mistakes of European countries, and we have had the benefit of wise leadership that has instructed us where and how to prepare against a shortage. Forewarned is forearmed, and by our willing and voluntary heed to the advice of our leaders we have avoided the extreme pinch of want and the inconvenience of a total shortage of supplies. It is direct evidence that the people of this country are wise enough to listen to advice and patriotic enough to follow it when they see that it is good. -Trade News.

Good and Bad Economy

On first thought one will insist that economy is all right and waste is all wrong, especially when the air is full of admonitions to conserve everything imaginable. But there are times when economy can be carried so far that it is wasteful, and this is especially true in the finishing of

photographs.

The developer you hesitate to discard might develop another dozen prints, but if you keep it until tomorrow it will be badly oxidized, you will not be satisfied to use it for the small number of prints it will develop and as a result you will probably have to throw away several stained prints and lose the time necessary for making them over. Incidentally, you may have disappointed a customer by not having an order completed.

A small economy of chemicals is much more than offset by the waste in time, labor and

material.

The same is true of the fixing bath. One photographer says to another, "I never throw my fixing bath away, I just strengthen it." But ask the demonstrator if he ever hears any complaints from the photographer who practices such economy. You will find him complaining of poor paper, poor chemicals, poor plates, in fact, everything has something wrong about it except his method of practicing economy.

Practice economy, as you should, but not at a loss of quality in your work—loss of time of employees or loss of material that will surely be wasted because of improper chemical treatment.

There are a dozen or more disasters that may befall sensitive material that is not properly developed or not properly fixed in fresh, clean working chemical solutions, especially in warm weather. Don't take chances by practicing camouflage economy.—*Photo Digest*.

To Hold Up.

TRADE is reported as steady and strong in practically every locality in the central territory, and at the same time the labor situation offers no relief, either for those who need more help to take care of their increased volume or for those who have lost help on account of war activities and who want to replace. It is a constant strain to hold up the output to the increased demand, and many devices must be resorted to in order that this may be accomplished continuously. We can all stand a rush of overwork for a limited period, but in calculating for a long period it is absolutely necessary to so arrange working conditions that a day's work shall be intensive but not wearing.

The Government wants business to "carry on" just so long as it does not interfere with war production, and it has officially placed photography among those occupations that are useful to the public while not strictly a necessity, and in their rulings as to supplies and activities, they have not taken any steps that will kill the business, but have taken measures to reduce and conserve the consumption of certain materials that the Government needs for its war activities. Therefore,

we must go right on with our work, but we must learn how to hold up our business without encroaching on the labor, chemical or material requirements of the Government.

That it can be done, there is no doubt, but that it will require calculation and planning there is also no doubt. It is up to you to arrange your work, your help, your tools of trade, your formulae so that you, each one of you, will conform perfectly to the rules. If one breaks the rules, the class will be held responsible, and unless the compliance is voluntary it will become compulsory.

If a labor-saving device will enable you to do more work with less help, go get it. If in search for more economical methods of making pictures, go hunt for these methods and put them into use. If you can give employment to some one who is now doing nothing and who knows no trade, break them in and teach them how to earn a living and help in the work of the country. It will be quite a little trouble to teach a perfectly new employee, but you will be doing your duty and you will find that it will yield you a most gratifying satisfaction. Furthermore, it will enable you to hold up under the strained conditions that prevail now and will continue, without relief, until the war is over and then for a while. —Trade News.

Danger of Sulphide Fumes

PLATES and papers should never be stored within reach of the fumes of hydrogen sulphide which are given off from the sodium-sulphide toning bath. Where batches of bromide prints are toned almost every day, the cumulative effect of the fumes is enough to ruin a stock of sensitive material in a few weeks. Plates will develop with an iridescent stain, and will show general deterioration and fog. Bromide and gaslight papers will be affected in practically the same way and will produce dirty, flat prints of poor quality. P. O. P. will assume a metallic luster and will be very difficult to tone. Naturally, the first impulse of the professional, when he discovers these defects in his negatives and prints, is to suspect the keeping quality of his material. If he will reflect, however, he will surely recognize that no manufacturer can make the silver emulsion of his plates and papers proof against the action of hydrogen sulphide fumes.—Professional Photographer.

The New Artograph Screen

There has recently been put upon the market a time and labor-saving device, called the Artograph Screen, which, used in printing portrait negatives, gives a pleasing blending of shadows and high-lights, combined with a stipple effect that makes retouching practically unnecessary. With the Artograph Screen one can make prints that preserve the character and natural modeling without the unnatural skin texture that excessive retouching produces. These screens will last a lifetime and save their cost, many times over, in a very short time. Write for further particulars, addressing: The Artograph Screen Company, 500 Fifth Avenue, New York.



The WORKROOM

ONTAINING THE LATEST PROCESSES, FORMULAE AND APPLIANCES NEEDFUL IN THE ART OF PHOTOGRAPHY FOR THE OPERATOR & WORKER

TIME DEVELOPMENT WITHOUT CALCULATION, AND A NEW INTENSIFIER ACID FIXING BATH, ETC. PLATINO SURFACE CARBONS A TINTYPE ON GLASS A SIMPLE TALK ABOUT THE LENS SULPHITES AND METABISULPHITES KALLITYPE PRINTING PHOTOGRAPHIC VARNISHES PIGMENTS AND DYES USED IN PHOTOGRAPHY SUBSTITUTES FOR A REPEATING RACK THE USE OF WHATMAN PAPERS IN PHOTOGRAPHY MILDEW ON PHOTOGRAPHS AND PRINTS USE SODIUM SALTS AN ENLARGING STUNT COMMERCIAL COLOR PHOTOGRAPHY SMOKING IN THE DARK ROOM SUBSTITUTE FIXING BATHS FOR FILMS, PLATES AND PAPER NOTES ON NEGATIVE DRYING WHAT IS FORMALIN? HARDENING PRINTS WHEN MATT PRINTS HAVE TO BE COPIED SPOTTING GLOSSY BROMIDE PAPER CAUSES OF FAILURE IN SULPHIDE TONING RED CHALK, PURPLE RED AND BLUE TONES ON BROMIDE AND GASLIGHT PAPERS ILLUMINATION IN RETOUCHING AND FINISHING EQUIPMENT FOR OUTDOOR PROFESSIONAL PHOTOGRAPHY

BACKING PLATES



THE WORKROOM

By the Head Operator



Time Development without Calculation, and a New Intensifier

Nowadays when materials are costly and leisure for photographic work is limited, time and tank methods of development have much to recommend them on account of the high average of good results in the way of correctly developed negatives that can be depended upon by their use. For the user of the modern small camera, the development of a number of little plates at one time (held vertically in a rack) in a tank is really the only practical method, even though the time or factorial system is not taken advantage of. For the photographer who wishes to use very dilute developers to obtain certain results, stand development is the ideal method, provided the developing solution can be set in motion from time to time, by reversing the tank, for instance.

The timing method of development possesses several practical features of interest, although it has one or two drawbacks. One of these latter is the necessity of doing a certain amount of mental arithmetic, unless one is provided with a special clock or elaborate set of tables. But if we arrange matters so as to use a developer with time factor of 12, any ordinary clock or watch will do the needed calculation for us at sight. An example will make this clear in a moment. We wait until the second-hand of the watch is at the 12 o'clock position—i. e., the end of the second—then pour on the developer. Now suppose the first sign of the image shows when the second-hand is between 25 and 30, i. e., between 5 and 6 o'clock on an hour dial—then our full time of developer is between five and six minutes. Or we may put the same thing another way, and say, develop one minute for each five seconds the image takes to come out or appear.

Thus if the image appears in between thirty-five to forty seconds, *i. e.*, corresponding to the positions of the figures ⁷ and 8 on a watch or clock, then seven minutes is the full time of

developing in that case.

Here is a simple and economical developer which works quite satisfactorily with this method of timing:

		Α		
Water				$1\frac{1}{2}$ oz.
Soda sulphite (cr	vst	als)		$1\frac{1}{2}$ dram (90 gr.)
Potass. metabisu				
Pyro				24 gr.
Water to make			Ċ	2 oz.
TTT		B		

Water 10 to 11 oz. Soda carbonate (crystals) Soda sulphite (crystals) . $\frac{3}{4}$ oz. (or 6 dram) Water to make . . . 14 oz.

(456)

To mix a developer take 1 dram of A, and add

B to make a total of 1 oz.

Usually the image appears (at 65° to 60° F.) somewhere between twenty and forty seconds. So that it is advisable to keep the plate covered up for the first fifteen seconds. This wets the plate, and so reduces its sensitiveness and renders it less likely to be fogged by dark room light. The cardboard cover of the dish can be then raised for one second or less, at twenty seconds, again at twenty-five, thirty seconds, etc. As soon as the beginning of development has been first noted, say at the thirty-second peep, we then may continue development for five minutes without any further uncovering of the dish at all. It will make very little difference whether we develop just over five or just under six minutes. If we fancy a rather soft-contrast negative we naturally shall keep to the shorter time—or the longer time for a bright negative.

A New Intensifier

Most of our present-day methods of *intensification* involve two processes—bleaching, rehalogenising, etc., and darkening, redeveloping, etc. Moreover one cannot see the result until it is too late to alter matters. True we have some one-bath processes, but these are not unlikely to call for the use of ingredients which may not be at hand. At the same time the one-process methods (uranium, for instance) have the not inconsiderable advantage of enabling us to see how far we have got at any moment, and so to stop the process at any desired point.

One of the processes advocated just before the war was physical development with mercury and metol. But to some skins metol is anathema. The question naturally suggested itself, "If

metol, why not pyro?"

A few experiments have shown us that it is not only possible but easy and practicable, provided the worker will exercise plenty of patience. In addition to the pyro-soda formula mentioned above, we require one more solution, viz.:

Water 1 oz. Mercuric chloride (bichloride) 12 gr. Potass. bromide 12 gr.

(As the mercuric chloride does not dissolve very readily it is advisable to use warm water.)

To intensify a plate take 1 dram of A (pyro) and dilute with water to 1 oz. Bath the plate in this for two or three minutes. Return this to the graduate and add 1 dram of C; again bath the plate for two or three minutes. Then add a few drops, say ten, of B, and again apply the mixture

to the plate; at the end of a minute or two add another ten drops of B, and so on-using plenty of patience. Presently the mixture grows discolored and begins to throw down a finely granular black precipitate (possibly mercurous oxide). This may be ignored and will do no harm to the plate. The orginally black negative is slowly intensified, and at the same time slightly changed in color to a warmish or brownish black. (One would imagine that the imparted color in the case of a lantern slide would prove acceptable, but we have not yet had an opportunity of putting this conjecture to the test.) The chief drawback to this process seems to be its slowness. But this perhaps may be met by further experiments.—Amateur Photographer.

Acid Fixing Bath, Etc.

1. We have been using acetic acid in fixing baths, but cannot get it any longer. Will sulphuric acid do in its place? 2. Can you tell us of anything that will take the place of methylated spirits for cleaning cards, etc.? 3. Can you give formula for making a glass roof dull, instead of using tissue paper for keeping sun out?

1. You can use sulphuric acid in the following

ay:								
Add-								
Strong s	ulph	urio	aci	id			2 c	lr. fl.
Water							2 c	ZS.
To—								
Sodium	sulpl	nite					· 2 c	ZS.
Water							6 0	ZS.
And pour t	the n	iixt	ure	int	0-			
Hypo							16 0	ZS.
Water								DZS.
Finally add	d to	the	abo	ove	mix	tur	e	
Chrome	alun	1					1 (Z.
Water							8 0	ozs.

2. Petrol or benzol will answer, or a weak ferricyanide and hypo reducer may be applied with cotton-wool before the final washing.

3. Zinc-white (oxide of zinc), ground in oil and thinned with turpentine, stippled on with a nearly dry brush, or ordinary starch as used for mounting mixed with common whiting.—The British Journal of Photography.

Platino Surface Carbons

In view of the growing difficulty of obtaining platinum papers and the ever-increasing cost, it may be useful to remind the profession of a method of making carbon prints which are entirely free from gloss even in the deepest shadows. The procedure is, if anything, more simple than that usually practiced, and there is no additional outlay beyond the purchase of opal glass to serve as a temporary support in place of the usual "flexible." The opal glass must be finely ground, and it is desirable before taking it into use to smooth it a little with a flat piece of hard wood and a little emery powder and water. If the opal has a "satiny" feel to the finger this will not be necessary, and the preparation of the surface may be proceeded with. This is nothing more than well rubbing with powdered steatite or French chalk, which is dusted on or, better still, scraped from the

lump with a knife. The powder must be rubbed on with a pad or cloth or flannel, considerable pressure being applied during the process, the surplus being wiped off with a soft duster. The exposed tissue is mounted and developed and transferred in the ordinary manner. It will be found that the prints strip easily, usually falling off the opals as they stand in the drying racks. It is worth noting that it is much easier to work with freshly sensitized tissue than that which has been allowed to become "ripe." If very hot water or soda has to be used to obtain clean prints there is a much greater chance of the tissue sticking to the temporary support than when development has been carried through at a lower temperature.—The British Journal of Photography.

A Tintype on Glass

EVERYONE is familar with the "tintype" photograph, which the itinerant photographer at the Annual Fair used to turn out complete in a very few minutes; but the details of its production must be mysterious enough to most photographers, who do not find anything in their own procedure at all parallel to what he appears to do. They may have though it would be interesting and amusing to be able to make such tintypes or their equivalent; but if they have carried their investigations any further they will have discovered that he uses the wet-plate process, which is proverbially difficult and tricky, requires special apparatus in the way of a silver bath, dark slide, etc., and special solutions, and is accompanied by a staining of the hands, which has no parallel in dry-plate work.

The tintype, it may surprise some who have not looked into the subject, is not in the strict sense a positive at all, but a negative. If we could remove the film bearing the image from its metal support and transfer it to glass, we should find on holding it up to the light that, just as in the negatives with which we are familiar, the high-lights of the original are represented by dark patches, and vice versa. If we put a piece of sensitive paper under it, we could make a positive print, of a sort, from it. How, then, is it, some reader will feel tempted to ask, that it appears as a positive on the metal? It is a question worth looking into, as it may show that if we care to do so we can get a very similar result using only materials with which we are already familiar.

If we examine the tintype closely we shall see that although, if the metal were transparent, it would appear as a negative on looking through it, the parts which represented the high-lights, and therefore looked black when it was viewed in this way, are white, or at any rate a light cream color, when seen by reflected light. Any opaque substance, however white its surface, looks black when applied to glass and viewed by being held up to the light, as can be seen by putting a patch of whitening on a piece of glass. The image on the ferrotype is not only of a white color, but it is also very clear and thin. It was on this account that when we wrote above that a print could be made from it, we added the

words "of a sort." It would hardly have enough contrast to give a bright print, even on the most contrasty paper, and the result would look dull and heavy, especially in the shadows. In fact, the image has been kept thin and clear in order that the black japan on the metal support should show through. The consequence is that the high-lights by transmitted light would look opaque and black, while the shadows would look transparent and light; but by reflected-light, when the film is on a black support, the high-lights being white show as lights, while the shadows being transparent look dark by reason of the black support being visible through them. Thus we have in such photographs an image which is positive when looked at by reflected light, but negative when regarded by transmitted light.

If a similar result is to be got upon a dry plate, we must adopt some procedure which will give as white an image as possible. The writer was led to experiment in this direction by an accident. Having a couple of plates to develop, he realized after the solution had been poured over them that what he had used as water to dilute his developer was actually a solution of potassium bromide, and that in consequence his developer contained quite ten grains of bromide to the ounce. It was too late to remedy mat-ters, so development was continued with this highly restrained developer. The resulting negatives, which took a very long while to finish, were not very satisfactory, being hard and clear instead of full of good gradation. But one remarkable thing about them was that the image seen by reflected light was very white, so that they had quite a positive appearance, especially when viewed from the glass side. All that was necessary was to back them up with some-thing black. When opportunity arose, a num-ber of trials were made with different kinds of plates and different developers, which showed that almost any developer and plate, provided it had a full exposure and a very much restrained developer, and provided at the same time it was quite free from fog, would give quite a white enough image to be used in this way. It was found that even ordinary developers, without the addition of any restrainer, could be made to give very fair results, so long as the image was kept thin. It was surprising to see how an image which would be described in the ordinary way as black, actually had quite a light tint when it was seen against the black velvet. The metol and amidol types of developers, however, did not answer for this purpose; pyro and hydroquinone being those which were most uniformly satisfactory.

A Good Working Method

A good working process is to select some plate of ordinary, not extra-rapid, sensitiveness. There seems to be nothing to choose between different makers; but the ordinary gives a little brighter result than plates of a more rapid kind. The exposure having been found by means of the meter, at least four times what the meter indicates should be given, as full but not over-exposure is important.

The developer that is most suitable is one

of pyro-soda, which may be made up from the usual stock solutions, so as to contain in each ounce 1 grain of pyro, 30 grains of sodium carbonate, and 30 grains of sodium sulphite. This is then diluted with an equal bulk of a 5 per cent, solution of potassium bromide.

per cent. solution of potassium bromide.

The full success of the result will depend very largely upon the extent to which the development is carried; but as the action is a very slow one, there is plenty of time to form a deliberate judgment. The tray should be kept covered during the whole time except just at the moments when the plate has to be looked at, as complete freedom from fog is very important. One has to put away all idea of correct development in the usual negative-making sense. We are no longer concerned with density, but merely with color of the deposit and the extent to which the details in the shadows have been made visible; and as soon as all the details in those parts are out at all, we must stop the action of the developer, as any graying over, which in a negative would only mean a little slower printing, would in this case give a dull foggy effect. A few trials are necessary before the degree of development that gives the best positive has been determined; but it is not a difficult matter to learn just how far to go, and even if one's first attempts do not show the full capabilities of the plate to give a direct positive, at any rate they are almost sure to be good enough to be very encouraging.

An Acid Fixing Bath Required

As soon as development is complete the plate is fixed. For this purpose an acid hypo bath should always be used, as by stopping all further action of the developer at once it prevents any chance of development being carried further than was intended. The bath used by the writer consists of a solution of hypo of a strength of 2 ounces to the pint. This is made by adding to 1 ounce of the ordinary 4-ounce-to the-pint stock fixing solution 1 dram of the following acid bath and 7 drams of water.

Sodium sulpl	nite	(cı	ryst	als)		4	oz.
Citric acid						$\frac{1}{2}$	OZ.
Water to .						1	pt.

After the usual fixing in this the plate is well washed and allowed to dry.

If all has gone well it will present the appearance of a positive on whichever side of it we look, but the more perfect positive effect will be got by viewing it from the back or glass side. This is advantageous as it allows the black substance to be used as the background to the image to be put against the film, and the picture to be viewed from the glass side, which shows the image the right way round. If we had to view it from the film side, the side, that is to say, which in the camera is turned toward the lens, it would appear reversed right for left, as in the case of a tintype. A piece of black velvet, or of card painted with dead black varnish, pressed gently against the film, makes a suitable backing; and thin metal frames to put round the plate and hold a card behind the velvet are obtainable for small sizes; for large ones a little wooden frame is very suitable.

If a warm-tone lantern plate is used, and is developed with a solution containing both bromide and ammonium carbonate, as recommended for red tones, the image will be still whiter and also more delicate than anything that can be got upon an ordinary plate. Very good results have followed from the use of a developer made up from four stock solutions, consisting of 10 per cent. pyro, liquor ammonia, ammonium bromide, and ammonium carbonate. For each ounce of developer, 15 minims each of the pyro and ammonia and 60 minims each of the bromide and the carbonate are taken and diluted to make 1 ounce. Development is slow, and in consequence of the extreme whiteness of the deposit needs careful watching, as the progress of the image is not seen very easily. The draw-back to the use of lantern plates is that the exposures needed are very long, even in the most favorable circumstances.

As any clouding over of the deepest shadows very much interferes with the brilliancy of the positive picture, it is sometimes an improvement to give the finished plate a brief reduction with ferricyanide and hypo. This should be done when the washing has been about half finished,

but is best not before.

Increasing the Brilliancy

A crystal of the ferricyanide about the size of a split pea is crushed and dissolved in 1 ounce of water. In case there are any undissolved particles, which would give rise to black spots on the positive, it should be left for a minute or two, and then most of the clear yellow solution poured off into another vessel, diluted with an equal bulk of hypo solution of usual strength, and poured over the plate. A tap with running water must be close at hand, as the action is almost instantaneous, and if allowed to go any too far the result would be ruin to the picture. If the strength of the reducer seems to be so great as to be almost uncontrollable, a little water may be added; but the more rapid the action the better does it accomplish what we The solution should be poured on, the dish rocked for about four or five seconds, and then the reducer at once poured back into the glass and the plate thoroughly washed under a good stream. If after washing for a minute the reduction does not seem to have gone quite far enough, the operation can be repeated.

Reduction is not the only process applicable. The plates may be intensified, for which purpose the Wellington silver intensifier is quite suitable. It does not seem to interfere in any way with the whiteness of the image, provided the intensification is not carried too far; but, as a matter of fact, there is little or no risk of this, as it is most unlikely that the original development will not have given all the vigor that the process requires.

There is one other modification of such a method which may be mentioned. Suppose we get a perfectly black image, such as is usually got in negative making; it is possible to convert this into a white one. I have not tried bleaching and then redeveloping with a white-image developer, such as described above; but I have bleached a plate in a solution composed of 20 grains of copper sulphate and 20 grains of com-

mon salt to the ounce of water. In this the image speedily becomes quite white, and only needs a thorough wash to finish it. It is doubtful, however, whether such pictures are permanent.

As an entertaining variation from the ordinary routine of the photographer, these dry-plate positives are well worth the making. There can be no question as to their permanence, since there is no reason to suppose that they are any less permanent than negatives made in the ordinary way on plates of the same character. —Photography.

A Simple Talk about the Lens

A LENS may have one side flat or "plane," and the other curved (as is usually the case with both lenses in a lantern or enlarging condenser); or both sides may be curved. A curved surface may be convex or concave, according as we regard it from one side or the other. When we look into the bowl of a spoon, for instance, we are looking into a concave surface (think of a cave as a hollow place); while if we turn the spoon round and look at the bulging-out back we are viewing a convex surface. The words concave and convex are often abbreviated to Cc and Cx.

A lens has two surfaces, which may be Cc, Cx, or plane. Thus we may describe a lens as planoconcave, etc., *i. e.*, the near side plane and the further side concave. Turning the lens round it becomes concavo-plane. When describing a lens in an instrument we usually follow the path of the incident light. Now in an ordinary two-lens condenser usually the flat sides are outside, and the bulgy, curved sides inside, *i. e.*, toward each other, so that the first lens is plano-convex and

the second convexo-plane.

What about positive and negative lenses (telephoto, etc.)? It will suffice to say that any lens which is thicker in the middle than at the edges is a convex or positive lens, and can be used to form a real image on a focussing screen or plate. Correspondingly a lens which is thinner in the middle than at the edges is concave or negative (e. g., the negative component of a telephoto arrangement).

Now there is nothing like trying a simple experiment for making one see, understand, and remember things. And fortunately one can put to the test, in a quite simple way and with homely apparatus, many of the points which concern the photographer. For example, place a lighted candle a few feet away. Take a bit of white card or paper to serve as focussing screen in the one hand, and any convex lens (e. g., hand reading glass, spectacles of person with long or old sight) in the other, and "focus" the candle flame image on the card. If now you repeat the experiment with a concave lens (e. g., folders of short-sighted person) you find that you can not get a sharp or focussed image.

"But how about a negative (i. e., concave) telephoto attachment? That forms an image all right." Try again by putting your convex and concave (i. e., positive and negative) lenses together. You may, or may not, get an image. It all depends on the measure of curvature of the various lenses. The more bulgy the lens—the

greater the curvature, i. e., smaller the circle, or rather the sphere, of which it is a part—the stronger it is, or the more it acts on the light by blending, i. e., refracting, it inward or outward. A bulgy or strongly curved convex lens bends the rays of light (or impresses a stronger curvature) inward and converges the light of the candle to a small image nearer to the lens than is the case with a less curved or weaker convex lens. Correspondingly a negative or concave lens bends the

rays outward, i. e., is a diverging lens.

As Mr. Micawber summarizes the philosophy of life by pointing out that if our expenditure be less than our income, the result is happiness, while if the balance be on the other side, the result is misery, so we may say that in our lens combination of various converging (positive) and diverging (negative) powers, if the converging action is greater than the diverging we have a converging overplus or balance, i. e., an imageforming balance, and we can get a picture; but not so with a balance on the diverging side.

We need not go further into these matters just now, but we just drop the hint that the reader will be wise to keep these general ideas in mind against the time when we can extend our talk to telephoto and supplementary lenses, etc. For the moment we will go back to the case of the ordinary camera lens. In the low-priced instrument the lens not infrequently is what is called a single lens. At first glance it looks like just one simple solid piece of glass, with one side much more curved than is the other, and often one side is slightly concave, while the other is decidedly convex, i. e., concavo-convex, yet thicker in the center. This form is often termed a positive or converging "meniscus" (i. e., Greek for the crescent moon). In all probability this single lens is really composed of two different pieces (i. e., different kinds) of glass, i. e., two simple lenses cemented together. Usually the stop or diaphragm is in front of such a single lens. Suppose now we had a precisely similar single lens in front of as well as this one behind the stop, we should then have a symmetrical pair. Such a symmetrical or similar pair often is termed a symmetrical or rectilinear doublet, and if the stop is fairly large the lens may be dubbed "rapid," which term, by the way, can only be relative. A rapid rectilinear is often abbreviated to R. R.

What has already been said may perhaps have had the effect of making the owner of a singlelens apparatus somewhat out of love with or discontented with his outfit, but nothing what-

ever of this kind is intended.

In the early days of photography a great dea! of the best work of certain kinds was done with such single lenses. Some of this work has not yet been beaten. These old single lenses are what we should call "slow" nowadays; but rapidity, or brief exposures, are by no means always necessary. In portraiture, for example, where we have a steady sitter, a long-focus single lens will give a delightful quality to the work. "How about distortion?" More of a "bogey" than a practical objection. True, such a single lens may at times give a slight curvature to what ought to be a straight line; but this will only be noticeable where such a line falls near the edge

of the plate, and even then we shall need a very acute eye or a straightedge to enable us to detect it, so that for picture-making purposes we may ignore the distortion bogey. "And what about ignore the distortion bogey. "And what about slowness?" A relative term, as aforesaid. Usually a single lens works at about f/11. This, as the reader doubtless knows, requires double the exposure of f/8, which is usually the top speed of an R. R., while the more modern lenses (anastigmats, etc.), often work at f/5.6 or so, i. e., requiring half the exposure of f/8. In other words, one second with f/5.6 is equivalent to four seconds with f/11. But against all this one may set the fact that in former times what was then called a rapid plate we should now call ordinary or slow, say 50 to 100 H. and D., while nowadays we can have (if we want) plates of 300, 350, or 400 H. and D. Thus a slow lens and a rapid plate compare with a rapid lens and slow plate. Let those who possess slow single lenses bear in mind to avoid handicapping themselves by selecting unsuitable subjects or conditions, e. g., quickly moving objects in a poor light, indoor portraiture with the lens at all near the sitter, and so forth. The possessor of a rapid lens, e. g., f/4.5, may have to stop down to f/11 to get the required depth of subject definition, in which case he is brought

down to the single lens f/11 level.

We have been glibly talking about f/8, f/11, and so forth, but from novices' queries it is manifest that some of our readers are not very clear in mind as to one or two terms, e. g., focal length, also called "focus," f numbers, and so forth. Therefore, at the risk of wearisome repetition to those who already understand these things, we crave their indulgent patience. Take the simplest case of a single lens with front stop. Where the lens is in such a position that it gives a sharply defined or what some call a "clear" picture of a distant object, say 100 yards or further away, we say it is "in focus" for distance or infinity. The distance between the plate or focusing screen and (in this case) the nearest, more curved side of the lens may be called the "focal length" or (commonly) "focus" of the lens, *i. e.*, the lensto-sharp-image distance for a distant object. (This used to be called the solar focus, the sun being considered at infinity.) This (focal length) is often represented by the letter F or f. Let us suppose this to be six inches, just by way of example. We now measure the diameter of the circular opening of the stop. Suppose this to be just half an inch. If we divide the focal length (six inches) by the stop diameter (half an inch) we get the number 12. This stop with this lens would be marked as f/12, which is another way of saying the stop diameter is one-twelfth part of the focal length or f.

"But what is the use of these f numbers?" as they are sometimes called. One use is that they

help us to calculate and compare exposures.

But I have seen or heard it stated that the stops are made of such a size that as one changes from any stop to the next smaller the exposure has to be doubled." This very often is the case, but it is not always so by any means. But if we have their true f numbers we can calculate the corresponding or relative exposure values quite easily. For example, here is an old but still excellent single lens, with stops marked f/11, f/14,

Now how do these compare as regards exposure? All we have to do is to square (multiply by itself) the stop number, and we get the relative exposure times. Thus 11 times 11 = 121, and 14 times 14 = 196, or in round numbers, 120 and 200, or 12 and 20, or 3 and 5; that is to say, the equivalent exposures with f/11 and f/14are in the ratio of 3 to 5, or, if you prefer it, 1 to $1\frac{2}{3}$. In other words, three seconds with f/11 is equivalent to five seconds with f/14, or, if you like, $_{1\frac{3}{60}}$ ths, and $_{1\frac{5}{60}}$ ths, or say roughly $_{\frac{1}{3}3}$ d and $_{\frac{1}{2}0}$ th sec. The point to get hold of clearly is that the squares of the f numbers give us not the actual times of exposure, but the ratio of equivalent exposures.

Now let us leave our rather slow (yet very useful) single lens and turn to a modern anastigmat. It so happens that with many of these lenses we get f numbers like f/4.5, f/5.4, f/6.3, and so on, and from querists' letters we learn that sometimes 4.5 and 5.4 get a bit mixed. It will therefore be useful to compare the exposure ratios of these three stop numbers with our old friend f/8, as this (f/8) is a very convenient one to take as a kind of mental standard and aid to

It may be convenient to put matters in a tabular form, thus:

f numbers	4.5	5.4	6.3	8
Squares	20.25	29.16	39.69	64
Approximately .	20.0	30.0	40.0	65
Ratio	1	$1\frac{1}{2}$	2	$3\frac{1}{4}$
Ratio	4 T 3	6 1 3	8 1 3	1
Approximately, say	1/3	$\frac{1}{2}$	$\frac{2}{3}$	1

We at once see that there is a real and practical difference between f/4.5 and f/5.4, i.e., two seconds with the former being equivalent to three seconds with the latter. For example, in the case of a quickly moving object it might happen that in order to avoid visible blur, the maximum exposure permissible was $\frac{1}{30}$ th sec., while with a certain plate speed, etc., and f/5.4, the required time, in order to avoid under-exposure, was $\frac{1}{20}$ th sec. Here, then, we are between the devil and the deep sea, or, more politely, Scylla and Charybdis; but by using f/4.5 we can shorten our exposure in the ratio of 3 to 2, and thus give $\frac{1}{30}$ th, which avoids both under-exposure and

objectionable blur.

Just a final word by way of caution. A stop may be quite correctly marked, let us say f/6. But this does not imply that it is always that value under all conditions of use. As the French gentleman said about dining on board ship, "Au contraire." This f/6 marked stop is only correctly marked for use when the lens is in focus for distance or so-called practical infinity. Suppose this lens to be six inches focal length. For the moment we may stretch a technical detail and say a one-inch diameter stop is f/6. But suppose we are taking a near object with the lens, which now is perhaps eight inches from the ground-glass or plate. This is at the moment the "working distance" of the lens, so a oneinch stop would not now be f/6 but f/8. And what difference does this make? Apply the abovedescribed method of squaring the f numbers, i. e., 6 times 6 = 36, and 8 times 8 = 64, or roughly speaking, 3 and $5\frac{1}{4}$, or not very far away from 1 and 2. If you missed this point you might be led to say the plate speed was wrongly given or the stop incorrectly marked.

The reason why we have gone into this stop question may be put thus: A good print depends on a good negative, which in turn largely depends on good exposure, and this we see partly depends on understanding the use of stops.—Amateur Photographer.

Sulphites and Metabisulphites

Every practical developer formula includes, among the chemicals called for in compounding for the purpose of "preserving" the solution— for preventing discoloration of the developer and staining of the plate, film or paper. This preservative chemical is usually sulphite of soda, though quite frequently other chemicals are used, such as sulphurous acid, sodium bisulphite, sodium metabisulphite, potassium metabisulphite, and acetone sulphite. All these chemicals depend for this preserving power upon the gas known in chemistry as sulphur dioxide, or more commonly as sulphurous acid gas. It is this gas that is formed when ordinary sulphur is burned for fumigating purposes and that gives to a burning sulphur match its pungent odor. This same gas is used in the bleaching of straw hats and evaporated apples, being generated for the purpose simply by setting fire to roll sulphur.

Starting with sulphurous acid gas as a basis, the ordinary liquid sulphurous acid purchasable in bottles is made by allowing water to absorb the gas-in the same way that ordinary water is made by saturating water with ammonia gas. This sulphurous acid is sometimes called for in formulæ for hydroquinone developer and in some pyro-developer formulæ. In whatever formula it is used, as soon as the developer is mixed, ready for use, the sulphurous acid combines with some of the carbonate of soda or potash, or whatever other alkali is used in the developer, to form sulphite of soda, so that whenever sulphurous acid is used in a developer the ready solution is exactly the same as if sulphite of soda were employed. The only difference is that a stock solution of sulphurous acid with hydroquinone or pyro keeps better than a stock solution made

with sulphite of soda.

Sulphite of soda is made, thus, from liquid sulphurous acid and carbonate of soda. On the large scale it is usually prepared by pumping sulphurous acid gas through a solution of carbonate of soda until the alkaline carbonate has absorbed sufficient of the acid gas to neutralize The solution is then evaporated and the sulphite crystallizes out. If, however, we continue to pump gas through the solution of sulphite of soda, it will absorb as much more of the gas as was absorbed in making the sulphite, and a new chemical, acid sulphite of soda, or sodium bisulphite, is formed. This acid sulphite has, as its name implies, an acid reaction. It may be purchased either in the form of a strong liquid solution or as a granular powder. It always smells strongly of sulphurous acid gas and can, for many purposes, be used in place of the acid. It is excellent for preserving a pyro stock solution, and may be used as an addition to the ordinary hypo bath to keep it clear in hot weather. However, acid sulphite of soda is so variable in strength and so easily loses its strength on exposure to the air that it is much better to use sulphite of

soda instead whenever practicable.

Acetone sulphite is a curious compound of this acid sulphite of soda with acetone, or alkaline liquid. It acts in the developer exactly the same as if the two chemicals were added separately. Most of its peculiar actions as a restrainer are due to the fact that it neutralizes part of the alkali of the developer and so reduces its working strength. Sodium metabisulphite accomplishes practically the same purposes as sodium bisulphite. It is, however, rather more powerful than the bisulphite, somewhat in the same way that anhydrous sulphite of soda is stronger than the crystal sulphite. Potassium metabisulphite is very similar to sodium metabisulphite, but somewhat more of the potash salt is required to produce the same effect.

The relative preserving strengths of some of these preservative chemicals, weight for weight,

are theoretically as follows:

0
0
4
64
26
64

The relative quantities required, for the same preserving power, will be:

Sodium sulphite, crystals		2.0
Sodium sulphite, anhydrous		1.0
Sodium bisulphite		.83
Sodium metabisulphite .		.76
Potassium metabisulphite		.88

But in using these figures we must always keep in mind that our chemicals are practically never 100 per cent. pure. In the manufacture of high-grade developing and fixing chemicals every material used is chemically analyzed and compounded according to its actual strength. The variations are frequently as great as 25 per cent. and are much greater in bisulphites and metabisulphites than in the more common and depend-

able sulphite of soda.

It is often noticed that formulæ for pyro developer frequently call for sulphite of soda and sulphuric acid in the pyro stock solution. The two chemicals are usually so proportioned that they react chemically with one another to form bisulphite of soda in the solution. Pure sulphite of soda is neutral in reaction, but commercial sulphite is always alkaline, and the pyro keeps very much better in a solution that is acid with bisulphite or acid sulphite. The reaction in forming the bisulphite from sulphite and sulphuric acid is as follows:

The sodium sulphate which is formed has no particular photographic effect in the developer and may be disregarded.

When this acid pyro solution is mixed with the alkali solution in preparing the developer, the

bisulphite is again converted to sulphite, according to this reaction.

The sodium bicarbonate is a very weak alkali and its effect in the development may be practically applicated.

tically neglected.

Some few pyro formulæ call for the bisulphite itself to be used in the preparation of the pyro

stock solution.

Whenever bisulphite is used in this way it is useful to know the amount of alkali that will be neutralized by the bisulphite employed, so as to know just how strong in alkali our developer will be when mixed for use. Pure sodium bisulphite will require somewhat less than its own weight of pure sodium carbonate to neutralize its acidity, but as the ordinary granular sodium carbonate is usually of about 70 to 80 per cent. carbonate, and as the bisulphite may be anywhere from 50 to 85 per cent., it is perhaps as near as we can estimate to say that on the average the bisulphite will neutralize about its own weight of sodium carbonate, and in using the metabisulphite of sodium or potassium we will not go far wrong by allowing here, too, an equivalent weight of carbonate for neutralizing the acidity.

Whenever a developer is freshly prepared from the dry chemicals the acid sulphite and metabisulphite have no particular usefulness, and sulphite of soda alone is usually employed.

Kallitype Printing

THE kallitype process has lately been interest-

ing photographers.

It is some years since the first kallitype paper appeared on the market, and was withdrawn because the inventor was dissatisfied with the permanence of the results; but it may, perhaps, be remembered that in the instructions as then issued no hyposulphite was employed, the iron salts in the paper being first rendered soluble by a bath of borax and Rochelle salts, and finally removed in ammonia. Later experience has shown, however, that it is an advantage to use a hypo fixing bath, and that, if it is employed with proper precautions, the permanency of the print need not be questioned. Possibly, some photographic inventor may devise a kallitype self-toning paper, the introduction of which should give an incentive to these methods of iron-silver printing. The method, however, which I can recommend to those making a first trial of the process is as follows:

The Sensitizing Solution

A sensitizing solution is made up from ferric oxalate (75 grs.), silver nitrate (30 grs.), distilled water (1 oz.). In dissolving the chemicals, the oxalate is first weighed out and placed in a stoppered bottle. Water is then added, and the bottle placed in a saucepan of water, which is gradually heated until, with constant shaking, the oxalate dissolves. If it should not do so readily, the addition of 5 or 10 grs. of oxalic acid will put matters right, although there may be a little residue in any case due to the presence of

ferrous oxalate in the ferric salt. Unless the solution is quite bright, it should be poured through a filter paper before the silver nitrate is added and dissolved. When cool, the whole forms the sensitizing solution, and can be kept in the dark for a considerable time—several months. The paper is coated with a sensitizer precisely as described above for ferroprussiate.

In the case of very rough papers, care must be taken that the solution reaches the depressions, and for this purpose it should be thoroughly daubed on to the paper with cotton wool, being afterward uniformly distributed with a sponge applied first one way and then the other.

Development for Cold and Warm Tones

The printed kallitype image strongly resembles that in the platinotype process, being of a faint brownish color on a yellow ground. Exposure should be continued until detail is faintly visible in the densest parts of the negative. It will be understood that at this stage we have a print in which the image consists of reduced iron salt (ferrous salt), which possesses the power of reducing the silver nitrate to metallic silver, which power, however, is latent until a solvent of the iron salt is applied to the paper. Various substances may be employed for this latter purpose, chief among which are borax, Rochelle salt, sodium acetate, sodium tungstate. The formulæ based on various combinations of these substances permit of a variety of tones being obtained at once by development. For a pure black tone the following is a very good formula:

Borax	٠.					1	oz.
Rochelle	salt					$\frac{3}{4}$	oz.
Water						10	oz.
Potassiu	m bic	hron	ate	(1	per		
cent. s	olutio	on)		`.	Ť.,	7 to 9	dr.

Its results, however, cannot be compared with the process which has just been outlined in respect of delicacy and rendering of gradation, nor can the fine black tone of a kallitype print developed with borax and Rochelle salt be obtained. On the other hand, the process is capable of yielding prints of a pleasing, warm tone, and of a character as regards gradation which is often described by the blessed word "breadth." The following is a very suitable formula for this modified kallitype:

				Α				
Green	ferri	c	amı	mor	iiun	n	ci-	
trate								110 gr.
Water	•	•	٠	•	٠	٠		1 oz.
				В				
Tartario	aci	d						20 gr.
Water								1 oz.
				С				
Silver ni	trat	e						45 gr.
Water								1 oz.
				D				
Gelatin								30 gr.
Water								1 oz.

Solutions A and C will keep for some months in the dark, whereas B, owing to the formation of a mold, will only remain in good condition for a week. The gelatin solution should be prepared at the time of use. The gelatin is first swollen in a little water for half an hour, and is then dissolved by adding the remainder of the water, and placing the containing vessel in a saucepan of boiling water. The sensitizer is made up from equal parts of these solutions, as follows:

Half an ounce, say, of the gelatin solution, warm and fluid, is placed in a cup standing in warm water. A similar quantity of each of A and B solutions is added, and lastly, the same volume of silver solution, the addition of which is made a few drops at a time while stirring the mixture with a glass rod. The warm sensitizer is applied to the paper with a tuft of cotton wool, and evened with a camel's hair brush, which is dragged across the paper without pressure first one way and then the other. As soon as the coating loses its wet glassy appearance, and begins to look dull, the paper is hung up to dry, and in a few minutes in a warm room should be ready for printing.

It is exposed under a negative until a fairly vigorous image is obtained, the details in the highlights of the original being visible. The print is then placed in plain water for about a couple of minutes, and in this it reaches its full vigor, and becomes of a reddish-brown color. It is then transferred to a weak hypo bath, about 10 grs. of hypo per oz., in which it fixes, and, at the same time, becomes brown in color. The final removal of the hypo by about an hour's washing in water completes the process.

Photographic Varnishes

The development of photography during the last ten years has necessitated the production of a large array of accessories. Formerly a few varnishes for preserving negatives and enabling retouching to be performed were all that were necessary; now, however, a much larger variety of varnishes and lacquers is needed in the various operations incident to a many-sided subject like photography. In the following receipes and formulæ will be found instructions for preparing all sorts of varnishes that are used or likely to be used in photographic manipulations. them are treasured as trade secrets, and in exposing them to the public view we do so with the hope of helping many an operator over a difficulty. He, of course, will select that particular formula which will best suit his wants.

The usual resin made use of for a photographic varnish is sandarac. The resin is of great antiquity, and is commonly called gum juniper by dry-salters; it is not a fossil resin like amber, but is obtained by making incisions in the bark of a small tree growing in the northwest of Africa, and also from trees growing in Australia. There are three varieties of sandarac met with in commerce, viz.: (1) Choice sandarac, in the form of tears something like those of mastic, or in thin rods not more than one-fifth of an inch in thickness or one inch in length, which, however, get broken up into shorter bits by handling in commerce. The color is pale and very much like

mastic, but although transparent it has not the shining appearance of tears of mastic, but is covered with a whitish dust. (2) Common sandarac is of a deeper color, sometimes brown, with a reddish tinge, but it is less transparent and often impure. This also occurs in tears. (3) Australian sandarac consists of pieces much larger, but also in tears and non-transparent. In chemical composition sandarac consists of three resins, which may be separated one from the other, but they do not differ much in their behavior with the usual solvents. In physical qualities sandarac is hard, but brittle, and has a slightly conchoidal (i. e., shell-like) fracture, which has a glistening luster when fresh, but it is easily crushed between the teeth, and becomes reduced to a fine powder, which, however, does not agglutinate together. This fact is a distinguishing one, which enables sandarac to be differentiated from mastic resin, which does agglutinate when chewed. In taste it has a slightly bitter balsamic flavor and a faint smell of turpentine. At 100° sandarac begins to melt, and at 135° catches fire, and at the same time emits a characteristically pleasant smell. The density varies from 1.05, 1.066, and 1.092, according to different authorities. Old samples have a mealy appearance, due to dust on them. This dust is not due to attrition of one fragment against another, but to the unequal contraction of the resin in drying, which results in a mass of fissures that form facets, and which gradually separate from the mass and form a powder. In hardness sandarac is equal to Kaura copal. The solubility of sandarac differs. Thus, it is soluble in ether, and hot alcohol completely dissolves it, and amylic alcohol and acetone also dissolve it, but sandarac is only partially soluble in turpentine, chloroform, and carbon bisulphite, while it is but slightly soluble in benzole and petroleum ether. These facts should not be lost sight of, unless when making varnishes with these resins as a solid. Owing to the plentiful supply sandarac is very seldom adulterated—as a matter of fact, it is often used as the adulterant of higher-priced resins. Sometimes, however, a good quality of sandarac may be adulterated with German sandarac (i. e., gum juniper), a resin which is exuded exclusively by old juniper bushes.

The best test for such an adulterant is to heat

The best test for such an adulterant is to heat the suspected sample, which, if pure, will give off its characteristic odor, which is easily recognized; also, compared with a sample of pure sandarac

similarly treated.

Another form of photographic varnish is prepared from collodion, a description of which would be superfluous to all photographers.

Alcohol					100 parts
Sandarac					18 parts
Spirits of					1 part
All par	ts by	wei	ght		

Put the sandarac into a flask or bottle, and pour the alcohol on the resin. Then stand the bottle before a fire or over a gas-stove on a water-bath or sand-bath. It is best to stand the bottle in a saucer or other receptacle, so as to prevent the escape or loss of the contents should the bottle

become cracked or burst. The heat should be sufficient to support and to cause the spirit to boil (i. e., emit bubbles) till all the resin has dissolved. The bottle should not be closed too tightly, but only with a cork that has a V-shaped slit cut vertically into its side. This slit will permit the vapor to escape if the spirit becomes too hot, and so prevent the hot vapor bursting the bottle. A tin can is a good article for preparing the varnish when large quantities are to be prepared, but such a vessel does not permit inspection of its contents, so that you cannot readily know whether all the resin is dissolved. When the resin has dissolved in the spirit, and while the solution is hot, the spirits of lavender should be added so as to give brilliancy and transparency to the varnish. In using a water-bath—that is, a vessel in which water is placed to keep at the boiling-point while the vessel holding the varnish ingredients is stood in the boiling watera slab or mat of asbestos is a good, serviceable article to prevent the bottom of the vessel becoming cracked by the heat. If a sand-bath be used there should be a thin layer of sand maintained beneath the bottom of the vessel. A saucepan forms a useful receptacle for forming a water or sand-bath. If a tin vessel be used the bottom of it should not be soldered, but fastened by a lap joint in the metal. The precautions are necessary to the novice in varnish making, as by being forewarned he will be forearmed as to what risks are avoided in preparing a varnish when heat is required.

If two fluids be used as solvents—such as alcohol and turpentine—they should be mixed and the sandarac dissolved in the mixed fluid,

unless the formula direct otherwise.

No. 1.—Varnish for Black and White Work

Australian sandarad	С			360	parts
Venice turpentine .				360	parts
Columbian spirits .				$181\frac{1}{2}$	parts
All parts	by	wei	ght	-	•

Dissolve the solids in the spirits by the aid of heat as above described.

As spirit varnishes are very troublesome to filter and require special appliances to effect a perfect filtration, it is best to clarify the varnish by letting it stand undisturbed for some days, and then pouring off the clear fluid from the sediment, which will possibly contain *débris* of bark, leaves of the plant from which the resin was obtained. In clarifying varnish by standing, the varnish should be maintained at a uniform warm temperature, so as to prevent the deposition of any of the wax constituent in the solids which form the basis of the varnish.

No. 3.—Retouching Varnish

Ether .				10 parts
Sandarac				6 parts
Mastic .				6 parts
Shellac oran	ıge			1 part

Digest altogether at a gentle heat, and allow any deposit to settle. Then pour off the clear fluid for use.

No. 4.—Varnish for Negatives

Strong alcohol .		250
		350 parts
Bleached shellac		35 parts
Mastic		10 parts
Venice turpentine	٠.	1 part
Oil of lavender .		a few drops

No. 5.—Quick Drying Varnish for Negatives

Oil of turpenting			
lavender .			40 parts
Chloroform .			10 parts
Sandarac .			1 part
Mastic			2 parts
Dammara resin			4 parts

Powder the resin and pour the chloroform over. Then add oil of turpentine or lavender, and digest the whole over a sand-bath until all are dissolved. Filter the varnish, while hot, through cottonwool placed in the neck of a glass funnel, or else strain it through a piece of cotton fabric, and keep in well-corked bottles.

No. 6.—Dry Plate Varnish

Mix together equal weights of Japanese gold size and refined benzole, and apply to the plate when dry but warm. Drain off the excess of the varnish, and let the plates dry in a room free from dust for ten to twelve hours.

No. 7.—Mixed	Var	nish	hes .	for	Negatives
Lavender					
Sandarac .					
Oil of lavender					3 oz.
Chloroform					5 dram
Digest altogether at	ag	entl	e h	eat	

No. 8 .- Cheap Varnish

Easily rubbed up for retouching and easily renewed.

White hard varnish				3 parts
Columbian spirits .				5 parts
Mix together and warm	to	insur	е	incorporation

No. 9.—For Negatives, as Retouching Varnish (by Rubbing Down with Powdered Resin)

Alcohol			50	fl. oz.
Sandarac resin			9	OZ.
Turpentine			$3\frac{1}{2}$	OZ.
Oil of lavender			1	OZ.

Digest the sandarac in a mixture of alcohol and turpentine altogether. Clarify, and then add the lavender oil to the clarified portions.

No. 10.—The following is Useful for Gelatin Negatives

	. , . ,	Corre	00		
Alcohol				18	fl. oz.
Sandarac .				2	OZ.
Castor oil .				 3	dram
Oil of lavender				1 1 2	dram

Mix the alcohol and lavender oil and digest the solids in the mixed fluids. Then add the castor oil, keep the mixture warm until the solids are dissolved. Add a teaspoonful of whitish or prepared chalk, shake up well and set aside for these ingredients to deposit. Pour off the clear fluid for use.

No. 11.—To be Used on Warm Negatives

Rectified alcohol			250 parts
Bleached lac .			30 parts
Mastic			10 parts
Venice turpentine			1 part
The following are	us	seful	for retouching
negatives:			

No. 12

To every six ounces of alcohol add one ounce of lavender. Dissolve by heating, and then add four ounces of castor oil.

N	o. 1	3	
Alcohol			300 parts
Sandarac			50 parts
Camphor			5 parts
Castor oil			10 parts
Venice turpentine			5 parts

No. 14.—For Retouching Thin Film the following is Useful

Alcohol (spec	ific gi	ravıt	ty, i	830)	60 parts
Sandarac					10 parts
Camphor					3 parts
Venice turper	ntine				10 parts
Oil of lavende	er .				3 parts

Allow this varnish to harden before using the retouching pencil.

Collodion varnishes are very familiar to all photographers, but this paper would not be complete without giving some formulæ for the production of these useful varnishes. They are waterproof and can be made very flexible by adding a little castor oil. Collodion is one of the nitrates of cellulose, to which gun-cotton, pyroxylin, and dynamite are allied. The solvent of collodion is a mixture of alcohol and ether. Mixture: 1 part of collodion and 3 of alcohol and 18 ounces of ether. For a photographic varnish the proportions are:

Collodion				1	part
Alcohol				1	part
Fther				11	narts

The color and brilliancy of such a varnish can be varied by adding 25 parts of bisulphide of carbon or of benzole. As water affects the quality of the varnish, the collodion should be thoroughly dry before being dissolved. This is best effected by standing the collodion in a saucer, together with another saucer containing sulphuric acid, beneath a bell jar for a few hours. The acid is very hygroscopic and will absorb the moisture out of the collodion. Sometimes camphor is added to the collodion varnish, even to the extent of 50 per cent. It is absolutely necessary to have a mixture of alcohol and ether as the solvent. Acetone, wood alcohol, and acetate of amyl also dissolve collodion. The varnishes with acetone are opaque compared with those obtained by the addition of camphor. Wood alcohol has the same effect when it contains acetone in appreciable quantity.

Collodion dissolves very easily in acetate of amyl (nitrobenzole), yielding a bright, colorless, transparent varnish, which gives a coating that is more malleable than that yielded by the ordinary solution. This is how the varnish so widely known as zapon is made. Zapon spreads evenly over glass and gives a more homogeneous coating than other collodion varnishes, but it dries more slowly and is very flexible and suited alike to metal and to glass. The following method is a good one to follow in preparing such a varnish:

Gun cotton .			15 parts
Acetone			100 parts
Amyl acetate			200 parts
Benzine			200 parts

Dissolve the gun-cotton in the acetone, and then add the amyl acetate and benzine. The solution is then clarified by decantation and filtration.

The varnish thus prepared forms a supple adherent coating which does not shell off. The following formulæ are those of three well-known collodion varnishes:

	No	. 13	5	
Amyl acetate				1 gallon
Benzole				1 gallon
Pyroxylin .				10 oz.
	No	. 1	6	
Nitrocellulose				100 parts
Amyl acetate				150 parts
Amyl alcohol				150 parts
	No	. 1	7	
Nitrocellulose				100 parts
Amyl acetate				400 parts
Amyl alcohol				400 parts

Very much allied to collodion or celluloid, although this differs very considerably in its nature—nevertheless, collodion is closely akin.

It is a mixture of pyroxylin and camphor. Celluloid, when dissolved in a suitable solvent, yields varnishes, colorless, brilliant, and very adherent, flexible and easily colored, and rendered very supple by the addition of castor oil. These varnishes have a greater resistance than collodion varnishes, and yield a coating which does not shell off.

Celluloid is dissolved in the same solvent as that used for collodion. This is a mixture of alcohol and ether or pure acetate or acetone and amylic alcohol. The celluloid should be perfectly dry before being dissolved. A mixture of acetate of amyl and acetone produces photographers' crystal varnish, which is applied cold, giving a perfectly transparent coat. By adding a small quantity of gum resin a layer which has not such a polish is obtained; and this is more suitable for retouching. Wood spirit is the vehicle best adapted for thinning down celluloid varnish. For coloring these, a solution of aniline dye in strong alcohol is made. The necessary quantities are carefully mixed with the varnish while stirring.

Formulæ for Celluloid Varnishes

		No.	18			
Celluloid .					5 parts	3
Amyl acetate					16 parts	5
Acetone .					16 parts	3
Methylated si	ulr	huri	c et	ther	16 parts	

		No.	19			
Celluloid .						10 parts
Amyl						30 parts
Acetone .						30 parts
Methylated S	ul	phur	ic e	ethe	er	30 parts
Camphor						4 parts
		No.	20			
Celluloid .						5 parts
Amyl acetate						50 parts
		No.	21			
Celluloid .						5 parts
Amyl acetate						25 parts
Acetone .						25 parts

These varnishes are prepared by dissolving the celluloid in the fluid solvent.

Pigments and Dyes Used in Photography

THE increasing popularity of the carbon, gumbichromate, dusting-on, and other pigmented colloid processes, and also the extensive application of pigments and dyes in orthochromatic and three-color photography, have convinced me that the time is surely ripe for a treatise expressly devoted to the pigments and dyes employed, or suggested for employment, in photography. My conviction has been strengthened by the knowledge that in many pigment processes the workers thereof prepare their own emulsions and papers, and, furthermore, that the possibilities of these processes, especially the gum-bichromate are capable of wider expansion. Furthermore, much misconception has hitherto existed as to why we are limited in the choice of pigments for our processes, and, why certain beautiful pigments are eliminated from our formulæ. In this respect I shall endeavor to differentiate between a permanent and non-permanent pigment, although, as to the ultimate suitability of certain pigments for process work, every worker must be a law to himself. To enable me to condense multum in parvo, I have arranged the pigments and dyes in cyclopedic form, in alphabetical order, and made use of symbols and signs, to denote certain classifications of origin, etc., that require constant repetition. These symbols are as follows:

Symbols and Signs. O. denotes organic origin, i. e., vegetable, animal, and created life; IN., inorganic origin, i. e., from rocks, minerals, etc.; †, permanency of pigments.

O. Aniline. $C_6H_5(\tilde{N}H_2)$. Phenylamine, amidobenzene, a derivative of coal-tar. The basis of many dyes used in photography, especially in color work.

IN. Aurine. A dark, gum-like product, produced by heating a mixture of oxalic and sulphuric acids and phenol, and dissolving the product in ammonium hydroxide. The solution is then evaporated, a crystallized precipitate, soluble in alcohol and ether, resulting. It absorbs the yellow and green rays of the spectrum, and is used as a sensitizer, also as a dark-room fabric.

Azaline. A dye composed of a mixture of cyanine blue and quinoline red. Is soluble in alcohol, forming a carmine-red solution, which

absorbs the orange-red and yellow rays of the

O. Black. Bitumen or asphaltum, a thick, black substance from Judæa. Is used in photography in photomechanical processes for its property of becoming oxidized by light, losing its solubility in its solvents, chloroform, carbonbisulphite, etc.; also as a black varnish (in solution) for positives and other purposes.

Black. Ot. Carbon is the soot of vegetable matter obtained by destructive distillation. Is a very permanent pigment, from which the carbon

process derived its name.

O†. Ivory, is carbon obtained from animal

charcoal.

O†. Engraving, is a compound of carbon 3.8,

carmine lake 4, and indigo 2 parts.

O†. Warm, a compound of carbon 6, carmine

lake 6, burnt umber 4, and indigo 2 parts.

Black. IN. Oxide of copper of tenorite, is used to blacken diagrams, camera interiors, etc., its low reflecting index rendering it especially suitable.

O†. Lampblack, is carbon in a very fine state

of division, and is preferred to carbon.

Blue. The blue colors principally furnish us with color sensitizers for the yellow and red rays, only four are available for processes.

Blue. IN†. Azure, a beautiful sky pigment, composed of zinc oxide 1, lead glass 4, and deep

blue 2 parts.

Blue. IN†. Brunswick, is obtained by precipitating alumina from a solution of alum, and adding the sulphates of iron and baryta, prussiate and bichromate of potash.

IN†. Cerulean, is much used for coloring pottery, and consists of 79 parts of gray-flux, 7 of cobalt-carbonate, and 14 of hydrated carbon-

IN†. Cobalt, is oxide of cobalt. The exquisite blue of this compound cannot be matched and is very permanent.

Blue. Cyanin, a useful dye in color work, absorbs the yellow and red of the spectrum.

IN†. Deep, is oxide of cobalt compounded with borax, sand, and zinc oxide by fusion.

Indophenol or naphthalene-blue, suggested instead an azaline in combination with malachite green as a color sensitizer for the green, yellow, and red rays.

IN†. Prussian Fe₅Cy₁₂ is a pigment produced by the action of light on potassium ferricyanide

and iron-ammoniated citrate.

Blue. IN†. Turquoise, a pretty pigment composed of cobalt oxide 3, alumina 4, and zinc oxide 1.

Brown. Brown pigments, chiefly mineral, are used sometimes in the raw, but generally in a

burned state.

O†. Bistre, a rich, warm, brown color prepared from the soot of wood, especially beechwood. A very suitable pigment to show effects of light and shade.

O†. Amber, a particular form of amber in a burned state, obtained by mixing it with Prussian

blue

IN†. Brown, burnt umber, a semitransparent russet-brown pigment, derived from manganese.

It mixes well with other pigments, and dries quickly.

IN†. Ochre, is anhydrous oxide of iron. IN. Sienna. Burnt, a transparent orange-red pigment, derived from terra di sienna, an ochreous iron earth. It mixes well with other pigments, and very fine greens are obtained by mixing it with Prussian blue.

Chocolate, a popular compound pigment, composed of Chinese ink 3, purpurine 5, and alizarine

in soda 5 parts.

Brown.† Dark, a compound pigment containing indigo 2.5, Indian red 6, carmine lake 1.25, Vandyke brown 4, and lampblack 30 parts; very

suitable for portraits.

IN. Cappagh, pigments of various shades of brown, extracted from a bituminous earth, containing oxide of manganese and iron. The name is derived from Cappagh, near Cork, Ireland; but the pigment is also known as manganese brown and enchrome mineral.

O†. Reddish, a pretty portrait pigment composed of Indian red 10, carmine lake 6, and

Chinese ink 8 parts.

Brown. Red, a compound of Chinese ink 6, carmine lake 8, and Vandyke brown 8 parts.

Bice. †O. Bice—or bise—a pale blue pigment prepared from the lapis armenius. Bice bears the best body of all bright blues, and after ultramarine is one of the best of colors.

IN. Rock blue and green are prepared from

native copper carbonate.

O†. Carmine. The coloring matter of the cocus cacti, or cochineal insect, consists of carminic acid united with alumina, or oxide of tin. Is extensively used in the carbon process to produce the warm black and other pigments, and was formerly used to stain the red positive in three-color printing.

IN†. A fine pigment produced by the amalga-

mation of mercury and sulphur.

Chlorophyll. O. The green coloring matter abstracted from plants, is used as a sensitizer for the red and yellow, by Ives and others. Is soluble in most ethylenes, its solutions showing a red fluorescene.

Eosin. C20Br4H8O5. A yellow coloring matter, and the base of the eosin derivatives, all of which are efficient color sensitizers for the green and

yellow. Is soluble in most spirits.

Erythrosin. One of the best derivatives of eosin sensitizers for the yellow, and is used to stain the red filter in three-color work.

Fluorescein. A yellow coloring matter, recommended as an addition to developing solutions, to prevent fog, by absorbing erroneous light.

Green. Green colors are produced principally by mixing blue and yellow pigments together.

They are nearly all poisonous.

Green. Aldehyde is an optical and chemical sensitizer at the same time; it absorbs iodine and bromine, and gives sensitiveness to the yellow

IN. Copper arsenite is a pretty green pigment: composed of copper and arsenic (Scheele's green), mixed with malachite green and naphthalene-

blue; it sensitizes for the red rays.

IN†. Cobalt. One of the most beautifull pigments derived from cobalt. Very permanents

and suitable for processes. Mixed with signal green, is used to stain the blue-green screen in three-color printing.

Indian Ink. O. is carbon, or lampblack,

suspended in a colloid substance.

Indigo. O. A beautiful blue dye extracted from a number of tropical plants. One of the constituents of dark brown and engraving black pigments.

O. A blue coloring matter derived Litmus. from the Rocella unctoria. Is used to denomin-

ate acid and alkaline solutions.

Muriate of Copper. IN. A green pigment resulting from the union of muriatic acid and copper in equal parts. A pretty green process is based on this union.

Opaque. A pigment of reddish hue; as a

paste it is used for blocking out, etc.

Primuline, is golden colored amorphous powder. A pretty negative process is based on the property of primuline of becoming nutrated by nitrous acid and transformed into a lightsensitive derivative. The resulting combination is diazoprimuline, producing naphthol red when developed with B-naphthol; yellow with phenol; orange with resorcin, etc.

Red. Ethyl or chinoline, chinaldin, indoakyl, a dye used by Dr. Miethe to orthochromatize

plates.

†Brown, a pretty pigment, composed of Chinese ink 6, carmine lake 8, and Vandyke brown 8 parts.

IN†. Red-lead, a fine scarlet red pigment of

chromic acid and lead.

Naphthalene increases the sensitiveness of silver bromide for the yellow region (from near D to C), as also for the violet region.

†Transparency. A popular pigment composed of carmine lake 10, Indian red 6, and Chinese ink 4; very suitable for children's portraits.

Rosaurin. A dye frequently substituted for aurin. Is used to stain, or dye, fabrics for darkroom windows.

Red. Rosaniline nitrate is often sold as azaline, new red, and fuchsin; used in orthochromatic photography.

†Sepia. A fine combination of lampblack 4,

and sepia de Cologne 35 parts.

IN† Ultramarine. A blue pigment highly valued for the purity, delicacy, and permanency of its color, formerly obtained from the laps luzuli by a tedious process. True ultramarine is rarely used today, the artificial product, manufactured from china clay, sulphate of iron, carbonate of soda, sulphur and carbon, the proportions differing according to the shade of color required, being cheaper.

IN† Verdigris. A pretty green pigment,

derived from copper: formed by corrosion with

an acid.

†White. Lead, or Pattison's white, is an

oxychloride of lead.

IN† White. Pear, a beautiful pearly white pigment resulting from the union of bismuth and chlorine, i. e., trichloride of bismuth.

The yellow pigments are derived chiefly from

lead.

Yellow. Turner's is merely another form of oxychloride of lead.

IN. Chromate, is lead chromate.

IN. Dye, for fabrics, is a mixture of lead chromate and lead oxychloride.

IN†. Ochre, is a hydrocarbon of iron.

Zylidine. Zylidine scarlet, a dye recommended as an addition to the developer to prevent light fog, as it absorbs all erroneous light.

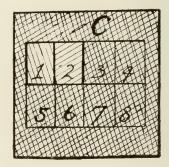
Substitutes for a Repeating Rack

When taking outside groups, picnics, dances, war charity affairs, etc., there is always a chance of increasing the order by inviting individual members or couples to sit for a few miniatures. The following describes a simple way of being prepared for such work.

It would not do to use a large plate for each sitter, and it would be very inconvenient to cart about a large quantity of small plates, each in a large slide. The correct way, of course, would be to use repeating backs, but this means a lot of weight to carry about (if the operator possesses them, and if he doesn't he may not feel justified

in further expense).

Provided the usual lens is of good covering power, small photos can be taken one after another on the same plate by using one or two pieces of cardboard blackened. If very thin board cannot be obtained, double thickness of black paper glued together and dried under pressure will do, but these must be carefully kept very flat. The cards are cut to fit exactly into



the square back of the camera, and the card must be thin, so that the back will fit in over a card without undue strain. In the center of each of two such cards is drawn the outline of the plate used.

This is divided into a number of sections, equal to the number of miniatures it is desired to take on one plate. This may be 2, 3, 4, 6 or 8: a halfplate will give two quarter size, three $4\frac{3}{4}$ x 2 panels, four $3 \times 2s$, six $2 \times 2s$, or eight $2 \times 1\frac{1}{2}s$. A p. c. plate gives either two or three useful sizes, and a quarter-plate two.

As an example, the illustration describes the cards necessary for an extreme case—eight on a half-plate. C represents the cards with half-plate outline drawn in center, and lines drawn dividing

it into eight equal parts.

In one card the section 1 only is cut clean out, and in the other No. 2 only is cut out. By placing either one or the other card under the back of the camera before focussing, any one of the eight portions of the plate can be used.

For No. 3 the second card is used with right side turned to left; for Nos. 6 and 7 it is used upside down, while the first card will give any of the four corners.

This can be used both upright and crossway.—

British Journal of Photography.

The Use of Whatman Papers in Photography

Whatman papers have for many years been regarded by artists as a standard, most of the masters of water color and etching having used these papers for their work. It is possible by a very simple process for the photographer to sensitize Whatman papers and obtain really artistic results. There are several surfaces—from a smooth to a very rough surface. The paper is cut into sheets of suitable size and floated upon a 2 per cent. gelatin solution for three minutes, then drained and hung up to dry. If there are any bubbles upon the surface of the paper after gelatinizing these can be removed by drawing the paper over a glass rod previous to hanging up. The emulsion for sensitizing is made in the following way:

Solution A

Sodium chloride				
Hard gelatin .				
Distilled water .				
Hydrochloric acid				20 drops
Bring up to 120° F.	u	ntil	the	gelatin is thor-
oughly dissolved.				

Solution B

Silver nitrate .				120	grams
Distilled water .				200	c.c.
Dissolve and bring	up	to 12	20°	F.	

Solution C

Hard gelatin .			80	grams
Distilled water.			1000	c.c.
Dissolve and heat to	120°	F.		

Mix the solutions B and C together at 120° F., then add solution A slowly. Allow the complete mixture to stand at a temperature of 120° F. for ten minutes, then cool rapidly and allow the emulsion to set. When the emulsion is thoroughly set, it must be shredded and washed in the usual manner described in any text-book on photography, and after shredding and washing may be coated at once. It should be coated at about 105° F., using a deep porcelain dish. The paper to be sensitized is floated on the emulsion for two minutes and drawn over a glass rod previous to drying. Paper so sensitized will have a speed so that the exposure necessary for an average negative (using one of the many forms of printing machines upon the market) will be about ten seconds.

Prints so prepared upon the Whatman drawing papers have a wonderful pictorial quality, and this effect can be further enhanced by mounting the print also upon Whatman papers of a surface and color that will suitably harmonize with the paper upon which the print has been made. Some of the most suitable Whatman papers for sensitizing and also for mounting are the Imperial Rough, the Imperial Cold Pressed,

and the Creswick Rough and the Cold Pressed. It is a very simple matter to hand-coat small quantities of paper, and the suitability of Whatman papers for this purpose gives many amateurs an opportunity to produce really artistic prints.

Mildew on Photographs and Prints

As photographers we are very fond of talking of the permanence of prints, as though we had no other consideration to bear in mind than the constitution of the photographic image. The effect of time with the train of deleterious influences it brings is often lost sight of. We have, for example, the enemy mildew, which attacks not only photographs, but perhaps to a greater extent engravings, water colors and other art productions. We have seen old silver prints under cut mounts, the print in a good state of preservation and the mounts speckled all over with spots of mildew. It is probable that the early photographic workers took especial care to employ pure mounting boards, paste treated with some antiseptic preservative, and, when framing their work, to paper the glass into the frame so as to exclude not only dust and moisture but the spores or other means of propagation of the fungoid growth which we refer to as mildew.

Nowadays the mounting boards commonly used are made of very poor stuff indeed, very largely of wood pulp or esparto-grass, if we may judge from the rapid way in which they discolor when exposed to light. The board is surfaced with smooth paper, but we have no means of knowing what putrescence there was in the adhesive employed. It has often been remarked that any mounting board will do for carbon or platinum prints, as they are permanent, but the mildew possibility has been overlooked when this remark is made. The dry-mounting method with the water-proof shellac tissue, of course, insulates the print quite effectively, and would, we believe, be valuable in the case of water colors.

—The British Journal of Photography.

Use Sodium Salts

It is necessary to repeat in these columns the warning which has already been given to professional photographers that the stocks of potassium salts in this country are so limited and the war requirements of the Government are so urgent that there is very little available for the private consumer.

There is not the slightest cause for anxiety among photographers, however, for the simple reason that for all practical photographic purposes the substitution of sodium salts for potassium salts makes no perceptible difference to the working of the solutions. Indeed, professionals would be acting patriotically, and at the same time reducing their expenses, if in making up formulas which call for such salts as potassium bromide and potassium metabisulphite, they would substitute the same weight of sodium bromide and sodium metabisulphite.

The most important saving can be effected in bromide. Large quantities of potassium bromide are used in developers and in bleachers for sulphide toning. In both these cases the sodium salt gives just as satisfactory results as the potassium salt, so that there is no reason why photographers should continue to use potassium bromide when supplies are already short for medicinal uses and for manufacturing purposes where it is absolutely essential.—*Professional Photographer*.

An Enlarging Stunt

WHILE enlarging magnifies the good qualities of a negative it does the same thing with its defects, and the worst of these is a cast-iron high-light. A very simple remedy is as follows:

Bind a thin piece of ground glass to the negative, glass sides together. Place in a retouching frame and with a small brush paint over the high-lights on the ground glass with glycerin. Those parts which have been made transparent in this way will print much more quickly and sufficient detail can usually be secured in hard high-lights.

A careful worker can secure some beautiful effects by this method of dodging and once used its value is readily appreciated.—*Photo Digest*.

Commercial Color Photography

There is no question that at present what money is to be made in color photography outside company-promoting comes from the various processes of photo-mechanical printing in three or four colors. This work is, however, of a highly specialized nature, and the "general practitioner" in photography cannot hope to include it in the ordinary course of his business. He may, nevertheless, at very little cost and pains become a very useful accessory before the fact by obtaining orders for this class of work, making the negatives, and handing them over to the actual blockmaker and letterpress printer for completion.

As in all other branches of photography, the plate-maker and the apparatus manufacturer have prepared an easy road for any worker of ordinary intelligence, and having provided suitable plates and light-filters it is quite easy to produce negatives which will serve as a startingpoint for the color-block maker. As most if not all of the likely subjects are still-life ones, no elaborate cameras are necessary, and even a repeating back of the Sanger-Shepherd type although convenient, is not really necessary, for any well-made camera, with the slides in perfect and uniform register, will answer the purpose without any alteration, except for a special front to carry the color-filters behind the lens. At a pinch even this may be dispensed with and the filters put directly into the slots provided for diaphragms in most of the older lenses or fitted into caps to go on to the front blood.

The procedure on the photographer's part is quite simple. He has to make three negatives upon panchromatic plates from each subject through red, green, and blue light-filters respectively. The relative exposures for each color are given upon a card in every box of plates, so that, starting with the original H. and D. number of the plate in its unscreened condition, he can easily estimate the necessary exposures. We

have made a quite satisfactory set of color negatives with an ordinary field camera, the color screens being films of gelatin fixed between thin black cards and used as Waterhouse diaphragms: the whole arrangement for a whole plate camera costing about half-a-crown.

The manipulative part is quite simple if a few necessary precautions are taken. In the first place it must be remembered that the plates are almost as sensitive to red light as they are to white, so that they must either be manipulated in absolute darkness or by a special green "safe light." As the latter does not enable the development to be watched, it is better dispensed with and development done by time only. This is conveniently done by having a light-tight cover to the developing dish, or, better, by using a tank and employing a stock one-solution developer such as Azol, which can be mixed without risk of variation. One thing is important: all three plates must be developed in one dish or tank for the same time, so that the development is absolutely uniform. It is even desirable to rinse them and fix them in the same dish, so that development is stopped at the same point with all. No light should be admitted until the plates have been in the fixer for at least five minutes.

Backing is very necessary. As the film is color-sensitive, light which passes through it and returns forms a halo to a greater degree than with ordinary plates. Moreover, the roughness of the backing makes it easy to distinguish the film side when filling the slides in darkness.

In order to provide a check upon the correctness of the relative exposures, it is very desirable to include a graduated monochrome tint in the field of the lens, where it can be cut out when printing. It is not necessary to do this in every case, but only when starting a new batch of plates, or where there is any serious variation in the color of the light. Such a tint may easily be made by exposing a strip of bromide paper in steps, so that they will range from a light gray to absolute blackness, using amidol for preference to get a pure neutral gray. This scale should appear identical in exposure and density in all three negatives, and if it does not do so, using the maker's exposure-figures, the exposures must be modified.

Three-color negatives should be clear, full in detail and not too dense. It is, however, an error to assume that, as it takes all three negatives to produce one print, only one-third of the normal density is required in each. A soft portraitnegative quality is the most useful.

These negatives, being successfully obtained, may be sent to the block-maker, who will make transparencies, from which he will produce his

screen negatives.

As it is fatal to success if there is any variation in size of image or of sharpness of definition in the three negatives, it is necessary to use a lens well corrected for color, and this cannot always be assumed from the price paid. Some expensive anastigmats are not suitable for color work, while a good rectilinear or symmetrical will answer every purpose. It is advisable to test the lens by copying a map or picture with well-defined lines which can easily be measured. From the business point of view it is not desirable

to experiment with various plates and screens. Choose a good plate, buy the screens appropriate to it, and master their working thoroughly, only heeding any advice from the block-makers

if they find the color renderings incorrect.

The block-makers and printers will willingly furnish specimens of any desired class of work so as to facilitate the business of obtaining orders.-

British Journal of Photography.

Smoking in the Dark Room

No doubt the best advice on the subject of smoking in the dark room is "don't." Particles of ash are liable to find their way on to prints and plates that are drying, and so lead to unpleasant consequences. However, there are many workers who, like the writer, find con-solation in the weed, and are not completely happy without a briar by way of companion. My own experience is that cigars are the safest dark room smokes, owing to the coherent nature of the ash, and there is really no harm in lighting up as soon as the red light is extinguished. Ash is almost sure to be blown out of a pipe after it has been alight for a little while, especially if a fine tobacco is smoked. Incidentally, refrain from "lighting-up" (pipe, cigar, or cigarette) while a plate or sheet of bromide paper is in the developing dish or otherwise exposed.—Amateur Photographer.

Substitute Fixing Baths for Films, Plates and Papers

THERE is a shortage of acetic acid at the present time and as this is due to its use for military purposes it has been necessary to find a substitute for the acetic acid fixing baths used for papers, plates and films.

Considering the price, the available supply and the suitability of chemicals that might be used, bisulphite of soda has been found to be the

logical substitute.

Acetic acid in combination with sulphite of soda prevents the fixing bath from becoming alkaline, prevents the release of free sulphur and

keeps the bath clear.

Pure bisulphite of soda will do the same thing but does not give a sufficient excess of acid to neutralize the alkali carried over from the developer. The result is a precipitation of the alum, or basic aluminum sulphite, to be exact.

The only way this precipitation of the hardening agent could be prevented was to use another form of hardener. Chrome alum was found most satisfactory as chromium does not precipitate readily and remains clear even when the bath is appreciably alkaline.

While the two following baths are prepared

from the same chemicals the proportions differ greatly and the same bath will not be found satisfactory for both paper and plates or films.

Thorough experiments have demonstrated the necessity for separate baths and the best results will be secured by using the one formula for the paper fixing bath and the other for films or plates.

CHROME	ALUM	Fixin	ΝG	BA	TH	FO	r Print
Water							64 oz.
Hypo							16 oz.

When thoroughly dissolved, add the following hardening solution, stirring briskly until solutions are well mixed:

Chrome	al	um				100 gr.
Sodium	bis	sulpl	hite			1 oz.
Water						5 oz.

Quickly but thoroughly rinse prints in fresh water immediately after developing and before placing them in the fixing solution. This will remove the excess of developer and lengthen the life of the fixing bath's acidity. Fix for about ten minutes, during which time prints should be well separated to insure uniform action of the solution.

Prints fixed in this bath will feel tough and leathery. As the bath becomes exhausted the prints will feel slick and slimy. The bath should be discarded at this stage and a fresh one pre-

pared.

CHROME ALUM FIXING BATH FOR FILMS AND PLATES

This formula, which is for ten gallons of solution, can readily be reduced for smaller baths.

Water				6 gal.
Нуро				21 lb.

When thoroughly dissolved add the following hardening solution while stirring briskly.

Water			1 gal.
Sodium bisulphite			2 lb.
Chrome alum .			$\frac{1}{2}$ lb.

Sufficient water should then be added to bring

the solution up to ten gallons.

This fixing bath works perfectly with film or plates and has exceptionally good keeping qualities.—Photo Digest.

Notes on Negative Drying

NEGATIVE drying does not, at first sight, appear a subject about which very much can be written, and many text-books either dismiss it in a few sentences or omit it altogether. Yet it provides many pitfalls for the inexperienced, and a knowledge of them and how they may be avoided will prove useful. It is quite possible to spoil an otherwise excellent negative by treating the drying in a careless or trivial manner, or by letting it look after itself, as is done so often.

After the plates have been thoroughly washed it is always a sound plan to take them one at a time, and holding them in a gentle stream of water to rub the surface with a plug of cotton wool. This not only gets rid of the scum which often forms on the surface of the film, but also removes any specks of dirt which may have been deposited by the water, and which, if not removed, will dry into the film, and print out as minute white spots. In contact prints these are unnoticeable, but they are apt to be troublesome when enlarging, and it is therefore a good thing to get rid of them. After this has been done, the plates are stood up on one corner, or placed in a

rack to let the superfluous water drain off them. With many people this is the end of drying as far as they are concerned, and the plates are then left to take care of themselves. This, how-

ever, is a very dangerous proceeding; the plates left in this condition take hours to dry, during which they are exposed to several forms of injury. The worst is probably dust. Very few places are dustless, and every particle which falls on the film will stick in the gelatin, and print out a white spot. In some places too there are insects which seem to thrive on wet gelatin, and the writer has had several plates spoilt by these voracious insects eating small holes all over the film. Gelatin is also much more liable to decompose while wet, particularly in warm weather, due probably to its being an ideal culture for

fungi and bacilli.

The quicker the plates can be dried, therefore, the better. The first thing to do is to get rid of as much superfluous moisture as possible. After the plates have drained for a minute or so, the edges and glass side should be wiped quite dry with a clean cloth. Any scraps of film which have got on to the wrong side of the plate can be removed at the same time. The film side can now be taken in hand. This is best done with a smooth handkerchief or piece of fluffless material, which is pressed down in close contact with the film. Another way is to press the negative face downward on one of the blotting pads which are specially made for this purpose. In either case the effect is the same. After the surface moisture has been blotted off in this way, the negative can either be put up to dry, or its surface may be given a further wipe with a dry, clean handkerchief; it is surprising how much wiping the film will stand—though, of course, it must be done very gently, and care taken not to scratch the surface. One word of warning is, however, necessary. In hot weather, when the film is very soft, these operations cannot be carried out unless the negative has been put through a hardening bath; but this, of course, is also advisable for other reasons.

The negative can now be put up to dry, and, speaking generally, the ordinary racks sold for this purpose are not very suitable. The grooves are usually much too close together, and unless there is a vigorous draught some portions of the plate will take an unnecessarily long time to dry, and uneven drying may result. Much the best plan is to drive a few wire nails into the wall. and to rest the plate cornerwise between two of them, the film side being downward. In this way they dry rapidly, and no dust can fall on the film. As mentioned above, the chief point to remember is that the plates must be dried as quickly as possible. Heat must not be used, unless the plate has been specially treated, nor must the plate be placed in the sun, but moderate warmth is useful; in fact, the ideal drying medium is a current of dry warm air. For this reason the best place to put plates for drying is just above the mantelpiece of a room where there is a fire. The plates can be put on nails, as described above, and the fire not only warms the air but also creates an upward draught.

One most important point to be remembered is that drying must be even. If a plate has been partly dried slowly, it must not be placed in a hot current of air to finish it off quickly. If this is done, it causes a difference in density between the two parts, probably separated by a distinct

line, and the negative will be ruined. For nothing can be done to remedy this, even re-wetting and drying again will not remove the mark.

If films are used there is practically no other way to dry them than by simply hanging up by suitable clips to a line, preferably in a current of air, and allowing them to dry thus. There are many forms of clips sold for this purpose. In the case of roll films it is a good plan, if space permits, to hang up the uncut length of film on a line (away from any wall) by a "bulldog" similar grip, allowing the wet film to hang straight down, clear of the ground. A second "bulldog" should be snapped on to the lower end of the film to weight it and keep it comparatively taut. The film is cut up into its sections when quite

We have dealt so far only with what may be called the natural way of drying a negative, when it is done without subjecting the plate to any special treatment. It sometimes happens, how-ever, that a negative has to be dried in a hurry, in order perhaps to get off some topical prints to the papers. For this purpose there are several methods which can be adopted, which are also useful in particularly damp weather, when it is next to impossible to get the plates dry by natural

means in reasonable time.

The most common method is to put the negative, after getting rid of all superfluous moisture as described above, into two successive baths of methylated spirit. They are left in each bath for about three to five minutes, and are then put in a warm current of air, or are waved about, and they will be found to be quite dry in about ten minutes. A few words of warning may be given about this process. One that the present commercial spitit, owing to the mineral naphtha in it, causes a whitish scum on the surface of the film, and is therefore not very favorable to clean work. Another, that it cannot be used with films, as the spirit attacks the celluloid. Care should also be taken to see that the plate is really dry before starting printing. It often appears dry before it really is, and unless it be given another five minutes, say, to become thoroughly dry, there is a risk of the paper sticking to the film when it is

When drying negatives with methylated spirit it is essential that the plates should have been thoroughly fixed, otherwise a white deposit may appear in patches in the film, giving an unfixed appearance. When this occurs, the only cure is to place the negative back in the fixing bath until the white patches disappear, and then re-wash and dry again.

A better method of finishing off plates quickly, as it shortens the time of washing as well as of drying, is to use a formalin bath (40 per cent. formaldehyde). The plates are simply rinsed after fixing, and are then placed in a 2 per cent. formalin bath for about ten minutes. makes the film so insoluble that it is unaffected by boiling water even. Six washes in hot water will be sufficient to remove the hypo, and drying, which is done by heat, should be complete in two or three minutes. This treatment causes the surface of the film to stand out in relief, but this can be removed to some extent by rubbing with a piece of chamois leather moistened with alcohol.

Care should be taken that the brand of plates being used is suitable to this process, as with some makes this treatment causes the film to pull off the glass as it dries. One disadvantage of this process is that it makes the film so hard and horny that it is next to impossible to carry out any further operations on it, such as intensification or reduction.

Neither of these methods gives such cleanlooking negatives as those dried naturally, and as they are attended with a certain amount of risk, and the saving of time is not very great, they should be used only in exceptional cases.—

Amateur Photographer.

What is Formalin?

FORMALIN is a 40 per cent. solution of a pungent colorless gas called formic aldehyde or formaldehyde. Why so called? Aldehyde is an abbreviation (like pyro, hypo, etc.); viz., al (cohol) dehyd (rogenatum), i. e., alcohol from which hydrogen has been removed. This accords with its chemical constitution, i. e., $CH_3.HO-H_2 = H.CHO$; i. e., methyl alcohol minus hydrogen gives formic aldehyd. But why formic? If to formaldehyde we add oxygen we get H.CO2H, i. e., formic acid, first extracted from red ants, also nettles. Formica is Latin for this lively insect. Formic acid is one of the many things suggested as a pyro preservative, but offers no special advantages. It is usually pre-pared from glycerin and tannic acid, the latter used as a developer in the early days of photography. Formalin is commercially prepared by a secret process cheaply, but can be produced in various other ways. It is a valuable antiseptic and food preservative. If sprayed on the window sills it will banish flies, who shun its pungent odor. Its vapor (gas) should not be inhaled or brought near the eyes. It reacts with soda sulphite, forming caustic soda, and thus is used in connection with hydroquinone as an energetic strong-constrast-giving developer.-Amateur Photographer.

Hardening Prints

Prints (P. O. P., gaslight, and bromide) may be hardened by a one in twenty bath of formalin, and this is better than the alum baths, at any rate for prints. In the case of prints, blisters generally make their appearance very soon after they go from the fixing bath to the washing tank. Therefore it is best to give them only a rapid rinse after fixing them. Use the formalin bath, after which the washing may take place as usual. It is important to have the fixing, formalin, and washing bath as near the same temperature as possible. A formalined print, dried and rewetted for glazing, very seldom presents any stripping difficulties.—Amateur Photography.

When Matt Prints have to be Copied

THEY should first be thoroughly wetted and then squeeged on to a sheet of clean glass. This helps to show up the detail in the shadows, and gives the prints the familiar rich appearance they have before they are dried. There is no danger of the prints sticking to the glass if they are not allowed to dry while in contact.—*Professional Photographer*.

Spotting Glossy Bromide Paper

It is usually considered a difficult job to spot glossy-surfaced papers with any degree of success, and for any negative which when printed will require considerable spotting one of the mattsurface papers is recommended for use. By the following method, however, it is possible to spot a glossy paper having a black and white image, and make a fairly good job of it: A small instrument, such as a pen-nib print-trimmer, having a small, sharp, and pointed cutting edge, is required. This must be as sharp as it is possible to get it. It is used to roughen very slightly the surface of the paper on the particular spot where the blemish is which it is desired to remove. A very gentle touch should be used, just enough to give the paper a barely perceptible tooth, and the white spot is then toned down to match the surrounding tint by means of a soft lead pencil. Black spots can be treated in this manner just as easily as white ones, and if too much is scraped off then it can be remedied by a touch of the pencil. With a little care, however, it is quite possible to reduce this without the use of the pencil.—Amateur Photographer.

Causes of Failure in Sulphide Toning

The method of bleaching bromide prints with ferricyanide-bromide and toning in sodium sulphide is still very popular, states the *Trade Notes*. There is no doubt that, with proper treatment, the results are very satisfactory. The color produced is usually a warm sepia, while that produced by the hypo-alum bath is cold sepia. There is, however, one point in which the hypo-alum toned print scores over the sulphide toned print, and that is in the purity of the whites.

From experiments made in our own laboratories, we find that in sulphide toning it is not possible to obtain absolute purity in the whites. The degradation is slight, and cannot be entirely eliminated, but it can be minimized by thorough fixation. Prints that were fixed in two separate baths for fifteen minutes each showed very little loss of purity in the whites: and this appears to point to the fact that the degradation is caused by silver being still left in the gelatin or its support. Varying strengths of bleacher and sulphide did not make any material difference; but it was found that when a print was "forced" in development the whites, after toning, showed decided degradation.

In order to produce the best results in sulphide toning it is necessary to pay particular attention

to the following points:

1. Prints should be correctly exposed, so that in development they reach the full depth in the usual time. "Forcing" is not only useless, but sometimes causes fog.

2. The fixing must be thorough, preferably in two separate baths, and the washing must also

be thorough.

3. The sulphide solution used must not be too weak.

4. Prints should not be left in the sulphide bath a moment after they reach the full tone.

5. On removal from the sulphide bath, the prints must not be allowed to stick together in the washing water.

We give below a list of the principal failures likely to be met with and their causes:

(a) Loss of detail in the half-tones. This is caused by the hypo not being thoroughly removed in washing after fixing.

(b) Degraded whites and local stains. These are generally caused by "forcing" in development, by insufficient fixing, or by omitting to keep the prints on the move during fixing.

(c) Blue spots. These are usually due to particles of iron in the washing water; and can generally be prevented by tying on the water tap

a bag made of swansdown or similar material.

(d) Yellowish tones. These are caused by the prints being over-exposed and not fully developed; also by the use of old or decomposed

sulphide.

The sulphide bath should not be weak—in fact, it can be rather on the strong side, but not strong enough to cause blisters. By dissolving four ounces of sodium sulphide in twenty ounces of hot water, we have a convenient stock solution from which a working bath can be made by taking three ounces of this stock solution and diluting it with twenty ounces of water.

We sometimes hear of one make or grade of paper being perfect for sulphide toning, while another is condemned as useless; but photographers should remember that all gelatins do not possess the same degree of permeability, and therefore a hard surface paper may require a

longer time in the fixing and washing.

Red Chalk, Purple Red and Blue Tones on Bromide and Gaslight Papers

WE have lately carried out some interesting trials with the process of gold-toning bromide and gaslight prints which had already been toned with sulphide and hypo-alum. The results obtained were very pleasing, and we think the details will interest our friends. A gold toningbath was made up as follows:

Ammonium sulpho-

cyanide . . . 40 gr. in water, 18 oz. Gold chloride . . 4 gr. in water, 2 oz.

The gold solution was added gradually to the sulphocyanide solution. The prints were put straight in the solution and kept on the move until the final tone was reached. They were then removed, washed for a minute, placed in a fixingbath of 3 oz. of hypo to the pint of water for three minutes, washed for fifteen minutes, and dried. We tabulate the results below:

1. Bromide prints toned with sodium sulphide: Toning complete in five minutes. Color, bright

Very slight intensification.

2. Bromide prints toned with hypo-alum: Toning complete in eight minutes. Color, a fine purple red, somewhat similar to portrait-purple carbon. No intensification and practically pure

3. Gaslight prints toned with sodium sulphide: These results were the least satisfactory, the

color being a very fiery red.

4. Gaslight prints toned with hypo-alum: Toning complete in two minutes. Color, a fine red-chalk. Very slight intensification.

The results on Rajina papers were very similar to those obtained on gaslight papers. Some untoned bromide and gaslight prints were placed in the gold toning bath, and in three minutes the bromides were toned to a deep blue-black quite free from double tones. The gaslight prints reached the blue stage in less than one minute. Prints that were green and overexposed were vastly improved by a short immersion in the gold bath.

These very warm tones show to the best advantage in vignette heads on a white background. There is every reason to believe that the results are permanent, and the process offers to the photographer an easy method of obtaining something different from the "usual thing." The toning bath can be applied with cotton wool when dealing with enlargements, as the process is somewhat wasteful of gold. A window display of a few large sketches in red-chalk, with perhaps a sketch or two of naval portraits in blue-black, would be very attractive. There seems little scope for error in the process, but when toning black gaslight prints to a blue color the prints must be removed from the toning bath the instant the tone is obtained, otherwise the whites will turn yellow.—Trade Notes.

Illumination in Retouching and Finishing

The illumination of the work is a subject which receives a good deal of attention in modern factory design. This is not only given from the altruistic point of view, but there is no doubt that more work and better work is turned out when the lighting conditions under which it is done are as perfect as it is possible to make them.

What is true of the large, well-organized factory is also true in its extent of the workrooms used in our profession. Notoriously many of them are small and ill-lighted, and we know that clean and excellent work is often produced, but how much better it is from the point of view of health and comfort if the lighting is the result

of a well-thought-out scheme.

In regard to the retouching-room, many excellent arrangements of light and easel have been described in the "B. J." of recent years, and any of these can be adopted. From the point of view of the eyesight, the best advice that can be given is not to try and see the shape and effect of each stroke of the pendil, but to sit well back so that the effect of the blending of the strokes together can be seen. It must be remembered that this it is which preserves the modelling given by the lighting, and this it is too usually which our clients are looking at when they describe the finished picture as a fine photograph. For working at night a light passed through a blue solution is often recommended and used. This is probably because of the similarity to daylight and to the idea that a blue light is a "cool" light to the eyes. In my own case I find most comfort with light diffused through light green tissue paper.

For work in the finishing room a north light is desirable, owing to the fluctuations being less

throughout the year. The windows should be high and large, and the worker should sit so that the window is to the left and partly behind. That is to say, the light should come from over the left shoulder. Particular care should be taken in the case of velvet papers to look out for patches of glare, because this, though perhaps not noticeable on the part being worked, will cause discomfort in time if it is anywhere in the field of vision.

If with all the best arrangements of lighting the work still gives discomfort to the eyes, it is probable that there are errors of eyesight which need correction. When consulting an oculist or optician about this, the nature of the work should be mentioned, and it is also an advantage to measure the average working distance in retouching and finishing from the eyes to the easel.

Finally, a word on eye-wear. The latest rimless pince-nez may be essential for the lady receptionist "of good appearance and address, but for the routine work of the darkroom there is nothing better than spectacles with curled sides that fit over the ears, and preferably made of a metal such as rolled gold or white metal which will not easily rust.—ARTHUR G. WILLIAMSON in British Journal of Photography.

Equipment for Outdoor Professional Photography

THE selection of an outdoor kit for professional work is a matter for careful consideration, as it is very easy to make a decision which will either result in lasting annoyance or in heavy expense to repair the error. The first point to be dealt with is that of size, and upon this there is a pretty general consensus of opinion in favor of 12 by 10. As the present price of plates and material is so high, there may be a temptation to choose something smaller, and hence it may be as well to give the reasons for the popularity of this size. The most important is that it is a standard one, and familiar to most customers. Nearly all, house and estate work, wedding and club groups, and flashlights of banquets have in the past been made on 12 by 10 plates, so that as a rule no explanation is required when booking an order. In the case of a photographer who adopted 10 by 8 there was constant friction with customers, who found that they received smaller prints than those they had previously had from other firms. If a smaller size is chosen it should be whole-plate at a correspondingly lower price, but as travelling expenses, labor, etc., are practically the same whatever size in reason is chosen, the standard 12 by 10 is an easy winner. Fifteen by twelve is too large for most purposes, and the apparatus too heavy to be carried by one person. It may be worth remembering that for many subjects 12 by 8 or even 12 by $7\frac{1}{2}$ (a 15 by 12 cut across) is quite large enough, and effects a considerable saving in weight and cost of plates. This should, of course, be made clear to the customer at the time of ordering. The camera should most certainly be of the square-bellows pattern. The conical pattern has only one good point, portability, and a host of disadvantages which more than counterbalance it. should be full rise and fall of front, and if necessary extension pieces, either flexible or loose.

should be fitted, so that the center of the lens may, if necessary, be placed opposite the top edge of the plate without admitting light at the lower edge of the sliding board. A cross-front should also be provided, and a spare one which is cut out to take a small panel which is interchangeable with the copying and studio camera is also very useful. One photographer we know has a standard panel four inches square which fits all his cameras, indoor and out, above halfplate size. This avoids a multiplicity of flanges and extra fronts or adapters.

A swing back is absolutely necessary; care should be taken that the utmost possible range should be secured. The central slides which carry the pivots and the slotted bars should be made so that the ends are flush with the face of the flange when the camera is closed up. longer they are liable to be bent. An existing camera can be easily and cheaply refitted in this

The bellows extension should be at least twice the longest side of the plate, three times is better, but in that case a very large and firm tripod is necessary to ensure steadiness. Two or more bushes for the T-screw should be fitted at various distances in the baseboard, so that the camera is well balanced at any extension. The T-screw should be of the pattern provided, with a winged nut, so that the nut may be removed, the screw inserted in the baseboard, put through the hole on the tripod top, then replacing the nut and tightening up. This saves much fumbling about, and scratching the baseboard. Turn-tables are not to be recommended for large cameras, especially for professional work where it may be necessary to screw the camera on to a step ladder or a scaffold board to get the desired position. In this connection it may be as well to point out that a long screw is often necessary—four or five inches is not too much when clamping on to a three-inch plank.

The dark slides should be of the usual book form, and any inner carriers should be made from the full size of the slide. The flexible parts of the shutter should be rebated, so that in case a small slit or hole appears in the hingeing material it will not admit light. It is quite easy to have butted joints altered by planing a groove and glueing on a piece of good veneer. The stops which prevent the shutters from drawing out altogether should come against metal, wood will fret away, and some day the slide will draw right out and a plate, perhaps an exposure, be lost. Safety catches, which also indicate whether a plate has been exposed or not, should always be fitted; they cost but a few pence, and remove all

chance of double exposures.

The lens outfit is as important as the camera, and the selection must largely depend upon the amount of money which can be allotted to it. As a general rule, very rapid lenses are heavy and needlessly expensive luxuries. No larger aperture than f/6 is needed for ordinary outdoor work, and even this aperture can rarely be used. A convertible lens with a focal length of about 16 inches with singles of about 24 and 30 inches respectively, and a wide-angle lens of about 8 inches will make a good beginning, which can be added to as desired. If convertible anastigmats are too costly

there are many other less costly forms, and even a good rectilinear need not be despised even in these days of lens progress. A telephoto lens may be required occasionally, and the original "Adon may safely be selected for this. It takes little room in the kit, and the cost is very small. Nowadays no kit is complete without color screens, so that the best can be got out of isochromatic There is a boom in anti-screen plates just now, but when there is a difficult problem in color values the screen is an easy winner. Wratten's K 2 and K 3 screens will answer for all ordinary work, and require less additional exposure for the same degree of color correction than those made with other dyes. The filter yellow K is, we believe, used by other makers, but unfortunately they do not advertise the fact, and its presence can only be detected by the spectroscope. The old brownish-vellow filters give very little correction compared with the newer yellows, and the green ones should only be used where a slight degree of correction is sufficient.

Some form of instantaneous shutter is necessary, but it should be simple and not connected with the lens mount. A behind lens roller blind, or central shutter fitted inside the camera and giving time and instantaneous exposures will be

found very suitable.

The tripod should be strong and simple, and within reason the larger the head the better. The legs should have a sliding adjustment, and should not be too slender. A floor stand composed of three radial strips which will pack up with the legs is very useful upon stone pavements and in picture galleries, as not only does it prevent slipping but permits the camera to be moved without disturbing its level. Moreover, it keeps the spikes from injuring a carpet or polished floor.

For outdoor work the focusing cloth should be of black waterproof and of ample size, so that in case of a sudden shower or of its being necessary to work in the rain the camera is well protected. A good focusing eyepiece and an exposure meter complete the contents of the case. The case itself may be of leather or stiffened mail canvas, but as solid leather cases are now almost unheard-of luxuries it may be pointed out that a very good and light case may be made of three-ply wood

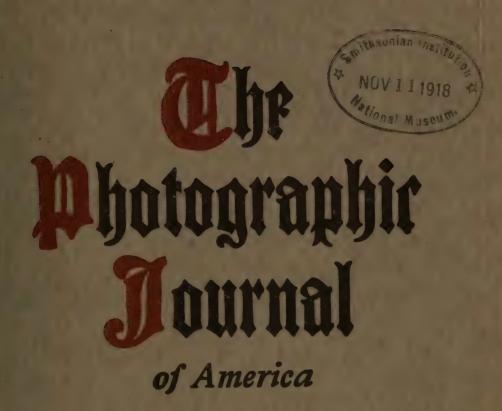
covered with leather cloth. Such a box will not be heavier than a solid leather case, and will answer the purpose until leather is once more obtainable by the man of moderate means.—

British Journal of Photography.

Backing Plates

As soon as the photographic public realized the advantages to be obtained by backing gelatin plates, the plate-makers were not slow in supplying very efficiently backed places as a regular line. Of course, they charged for the extra work, but the charge was trifling and the plates were cheap, so that we were very willing to avail our-selves of the convenience and to use backed plates whether the subject necessitated it or not. Now that plates have touched what, we hope, will be the high-water mark in price, the cost of backing has also increased, and we may well consider whether it is not worth while to revert to the old method of backing such plates as are actually required just before use. This used to be a simple matter in the old days, for few, if any, colorsensitive plates were used, and a red or orange pigment sufficed for backing. This is hardly sufficient for orthochromatic plates, especially when a screen is used and the light transmitted is very similar to that reflected from the backing. Hence there has been a tendency to use a black pigment, such as lamp-black, instead of burnt sienna or umber, the black being quite efficient even with panchromatic plates. All that is needed is a little lamp-black, ground in water or beer, from the oilshop, some caramel, and a few drops of glycerin (if obtainable). The color is mixed with the caramel and as much water as may be necessary, and smeared thinly over the glass side of the plate. If the plate is to be used at once, there is no need to allow the backing to dry; but if a number of plates have to be prepared in advance, they must be placed in a rack and covered up until the color has dried on. It will be found, if methylated spirit is used instead of water in thinning the color, that the drying will be effected much more quickly. If a calcium box be handy, the plate rack may be placed therein, and there will then be no danger of the film becoming damp through the proximity of the backing.—British Journal of Photography.

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THE RESULTS of our recent trial of Cyko Paper," writes Mr. H. A. Reedy, of the Artcraft Photo Company, of St. Paul, Minn., "proved that our printers could make a third more prints in a nine-hour day than with the other standard paper. This means that in one year four printers could accomplish as much as six had previously done."

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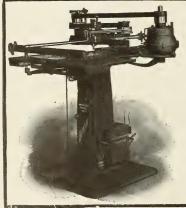


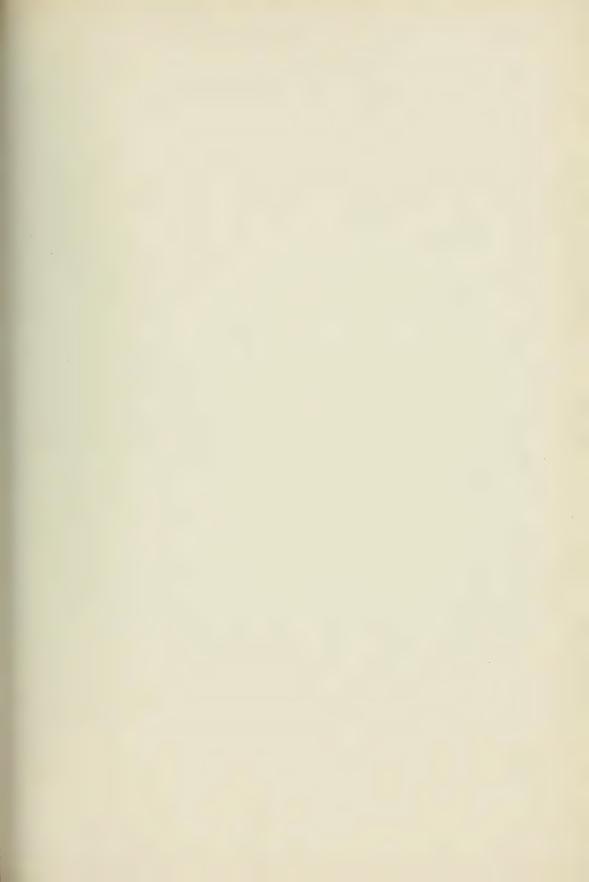
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PORTRAITS OF WOMEN

By JOHN A. TENNANT

THE first portrait made by photography was a portrait of a woman. Ninety per cent. of the work done by the professional photographer comprises pictures of women and children. This proportion has been maintained since photography began, and will doubtless persist until the end. If women and children were photographed as rarely as men are, three-quarters of those engaged in photographic portraiture as a profession would have to seek some other means of livelihood.

Taking the facts above stated as indisputable, one would naturally suppose (1) that the photographer would devote particular study to the possibilities in women as subjects for his art; (2) that the disproportionate amount of practice expended on women would make the photographer preëminently skilful in this special field and (3) that he would give considerable attention to women from a business standpoint.

Does he? Indirectly, yes; intelli-

gently and persistently, no. The average photographer accepts the facts as stated, and lets them go at that. He knows that the majority of his customers will naturally be women, because of human nature. Women are naturally graceful, and, of themselves, strive after pictorial effects; hence, they are easier to handle, and make more pleasing pictures than men. The photographer naturally desires to please his customers, and for his women customers as naturally does his best as far as his abilities go. But I hold that women deserve more than this. I am just as certain that women will appreciate and pay for all the consideration the photographer will give them. As a class they are sorely neglected by photographers.

Let us take New York, for example. One cannot pass through the city's streets day by day without noting the preponderance of beautiful women. But look through the display frames of the city's studios, and you will willingly

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agree with the ungallant San Franciscan when he says: "Your New York woman is 'nothing extra' in the way of beauty." I have observed this for years. Our women are beautiful beyond question. Our photographs of women are utterly inadequate. You can wander up Fifth Avenue or Broadway and hardly see a photograph of a woman worthy of a

passing glance.

What are the faults? Bad composition and lack of grace chiefly. Beauty is always interesting. These portraits fail to interest because they lack the attraction of beauty. The average photographer does not yet seem to have learned how to pose a woman so as to express the grace and beauty—the grace of manner and movement, the beauty of form and draperies—with which nature and art have endowed her. And there is usually even less skill seen in the arrangement of the figure and its accessories within the picture space—the composition of the

picture. With women the three-quarter or fullfigure pose is generally most desirable, but considering the abundance of opportunity we do not see that profusion of figure-portraits of women which one would naturally expect. And much more rarely, indeed, do we see a pose which has not some obvious and easily avoided defect. Women have more natural grace than men and less awkwardness of carriage; their draperies, too, offer a more pleasing variety of lines than is possible with masculine dress. over, it is much easier to give a woman something to do which will supply motive and interest in a portrait, beside enabling one to secure grace of action or

The most common fault in portraits of women is the too obvious pose. This is generally expressed in a nervous or conscious strain after attitude. The first element of success, therefore, must be flexibility, the relaxation natural to the figure when it is unconsciously easy. Where this nervousness is observed a good plan is to occupy the subject with some phase of action natural to a woman, as, for instance, the arranging of flowers, and the like. In this way by seizing an opportune moment one may secure

harmony in arrangement.

animation and grace of line in the figure as well as naturalness of expression. The moment of arrested motion may also be used to secure an animated and characteristic pose, as when a woman turns to greet a friend entering her room, or inclines the figure to take up something from a table, to arrange a lock of hair at the side of the head, etc. In all these details wherein we have pleasure in daily life a portrait may be had which will possess an easier grace than any formal

pose.

It will often happen, however, that a more or less formal pose is desirable to exhibit the figure or the costume. In such cases the pose depends upon the peculiar charm or beauty of these features. It may be that accessories will be needed to help out the lines, but these must be used skilfully because of their influence upon the proportion of the figure. For instance, in a standing pose of a woman under the average height, a low-backed chair of slight width and with long lines will add height and grace. The softly outlined, flowing folds of a curtain behind the figure, barely more than suggested, will also give the desirable appearance of height, or the subject may be made to stand (if it is accomplished without loss of ease) upon a very low footstool or a book placed upon the floor. The very common habit of permitting a space between the bottom of the front of the dress and the floor in standing poses should be avoided; it depends very largely upon the way in which the subject stands. Where the skirt itself is short, as in the present style, a sitting pose should be chosen. The standing pose is undoubtedly the best with most women for showing the figure and costume to the best advantage. Stiffness, when it is apparent, may be obviated by giving the figure a slight turn from or toward the light.

The profile of the figure, with the head turned to the three-quarter view, generally gives a graceful pose; in handling a plump figure in this manner, however, vertical lines near to the subject should be avoided as accentuating the curves of the figure in a disagreeable way. If the subject shows a costume with unusual fulness at the shoulders or bust, it is well, where possible, to make use of the hat to give proportion to the head, which might otherwise appear insignificant. Similarly, where the hat gives the head undue proportion, the sitter should be

persuaded to remove it.

The principal lines of the pose should always be disposed so as to lead the eve around the figure, with the head as the chief point of interest. Abrupt angles, I need hardly say, should be guarded against, and the "line of grace" adopted for the general direction of the predominant lines through the figure. forms of composition indicated are, of course, the pyramid or the use of the "decorative line." When the pyramidal form is used care must be exercised to see that the center of gravity falls within the pyramid or the figure will be unbalanced and appear as if ready to fall over. The alternative method is advantageous when the figure is in any other than an erect position; in its use a sense of balance is the essential thing to be secured

after grace.

In both standing and sitting poses the carriage of the head has great influence upon the success or failure of the portrait, altering its outlines in a remarkable way both as regards proportion and general effect. The lines formed by the dress when the subject is seated offer considerable difficulty in their harmonious arrangement, having a tendency to fall into triangles the apex of which is indicated by the knees. This difficulty may be obviated to some extent by selecting a chair of the right height for the particular subject-i. e., one which is neither too high nor too low, so that the knees are not elevated. The sitter should also be seated well forward, so that the legs are bent at an acute rather than a right angle; in this way the folds of the skirt will fall more freely. The practice of drawing the dress tightly about the lower part of the body, showing the form of the hips and figure, cannot be too harshly condemned. In like manner, a standing pose is often seen in which the hands are joined over the lower part of the abdomen, this latter catching the light and so being made more prominent because it is framed by the arms. similar fault is that of seating a woman in décolleté dress too low, or inclining

the body too far forward, so that the shoulders and bust are displayed in a

way bordering upon vulgarity.

The most troublesome feature of the figure-pose, however, is the disposition of the hands, about which women are sensitive to a degree. In consequence of this we find in looking over a number of portraits of women that the hands are most often conspicuous by their absence. Sometimes they are placed behind the back, or hidden under the pages of a book, or fan, or among a few flowers; at other times they are hidden in folds of the skirt, or by a light crape. When shown, the general complaint is that they are too large, a notion which has some foundation in truth, but also largely the result of the invariable practice among painters to represent the hands smaller than they are in life. There are various ways of meeting the difficulty, the best of which is to make one's self thoroughly familiar with the hand, its anatomy, its expressiveness, its varieties of arrangement and most graceful positions. Very much depends upon the lens.

In the treatment of the hands the first rule should be to avoid showing their full width, or, if they must be so placed, to see that they are so lighted or modelled by shadow that their apparent width is lessened. Sometimes one hand may be completely in half-shadow with advant-When a head, for instance, is posed leaning upon one hand, the effect is much better if the hand be against the dark side of the face and thrown into shadow by the head; and when the hands are not placed close together, so as to make a group in themselves, it would, I think, always be better to subdue one of

them somewhat by shadow.

As we have in hands a repetition of the same form several times in the fingers. we must endeavor to vary them somewhat. When the fingers are extended straight out and held close together, the effect is stiff; and if they be kept straight and spread equally, the result is a sprawled, awkward look. When the hand is open, three fingers pose together better than two, and some of the fingers should be drawn up, but not all equally. A completely doubled-up hand is not good—it is too like a fist; but a pose in the position of holding a pen or pencil,

as when writing or drawing, is one which looks well from many points of view. A very bad arrangement of the hand is when it is held flat and the fingers doubled up to the second joint; the squareness of the form and the impression of the ends of the fingers being cut off are very unpleasant. Again, the hand very much doubled up, but the index finger fully extended, is an arrangement which looks exceedingly awkward from several points of view.

A graceful pose is to bring the thumb and second finger slightly together, with the remaining fingers slightly raised. In this position turn the hand in any way you choose, and you will find agreeable lines, which will need but little correction to appear pleasing. The wrists as well as the arms will play important roles in the composition of lines; but can be mastered with very little observation.

When the sitter is a person of education or refinement it will often be noticed that the hands naturally assume a graceful position. Where this is observed the natural arrangement should be accepted. It is always the most characteristic when unconcerned, and drawing the attention of the subject to the hands will almost invariably result in awkwardness.

In small groups of two or three people —intimate friends or members of a family—a pleasing arrangement is not so difficult. They may be interested in the reading of a letter or book, or engaged in conversation or occupied with the antics of a child. Small groups of young men or young women are also easy to manage, because they may be occupied in something of common interest. When the lower parts of the figures present difficulty, the seating of the figures at a table will obviate the difficulty. In such pictures the form of the composition may be pyramidal, or we may simply seek a well-balanced arrangement and variety of line in the position of the heads or in the figures.

Beware of confusion of interest or too much complexity. The figures should not be too close together, nor the combination too large for the space it occupies, or the effect will be unpleasant. Sometimes the horizontal form suggests itself, as in a group of three children, of

which the half figures only are shown. In such a case the figures can be made to overlap each other, especially with children, but great care is needed here to secure a graceful outline of the heads. Speaking generally, a convex outline is preferable in all groups as giving solidarity, boldness, and grace. This line need not depend upon the figures, but may be secured by draperies or accessories, which, however, are not to be used unless directly helpful. and especially right angles and parallel lines of heads, are to be avoided, since they disturb the eye and prevent it from uniting the various parts of the group, which is essential to its unity. The heads are always the chief points of interest, and their relative position is the most important factor in the success of the group. They should not be so placed as to form any regular or geometrical pattern, nor placed directly above each other. Very little differences of position are important here and will give pleasing variety. The lines connecting the figures composing a group should be as simple and as graceful as possible. Thus a harsh, horizontal line between two figures will give the appearance of separation rather than of unity. Repetition of the same line or curve will sometimes be useful to convey a sense of unity obtainable in no other way. Converging lines should be avoided, unless there is some point of special interest at their convergence, as they will concentrate interest there.

There should always be a sinuous line connecting the figures so that none may be isolated and the effect of unity be lost. Similarly, whenever it is possible to express action in a group, this opportunity to supply interest to the composition should not be passed unheeded. In group composition there is abundant room of variety in pose and effect, the common purpose giving completeness of interest. Thus two or three young women may be arranged as chatting over a friendly cup of tea.

I had intended to deal with women as customers, but we must leave that branch of the subject for another article, as these notes have already exceeded

reasonable length.

EXAMINATION OF ORGANIC DEVELOPING AGENTS¹

By H. T. CLARKE

ROM the time that the European war cut off the supply of foreign organic chemicals to this country, two distinct activities have been apparent in the photographic developing agent trade: on the one hand the efforts of manufacturing concerns to produce the most necessary substances, like hydroquinone and salts of p-aminophenol, and on the other the less commendable manipulations of the purveyors of bogus and adulterated developing agents. For the control of both of these activities chemists are necessary—to check the purity of the genuine products and expose the composition of the false. Moreover in many cases developing agents are submitted under fancy names and it is necessary to identify the substances they contain.

The work of the analyst thus falls into three classes: the separation and identification of genuine developing agents, the quantitative determination of such substances, and the identification of the materials employed for adulteration or substitution.

The following scheme for the identification of the commoner developing agents is drawn up to meet the first; a few suggestions for quantitative work follows; but owing to the enormous number and variety of adulterants, no attempt can be made to indicate all of the methods employed for their detection and estimation, which in any case are subject to the methods of routine analysis.

Qualitative Methods—Group Tests Taking 0.1 g. of sample.

I. Insoluble in 5 c.c. of cold water. *p*-Hydroxyphenyl glycine.

II. Soluble in 5 c.c. of ether:
Hydroquinone.
Chlorohydroquinone.

Catechol. Pyrogallol.

III. Soluble in 5 c.c. of alcohol:

p-Aminophenol base.

p-Aminophenol hydrochloride. 5-Amino-2-cresol hydrochlo-

ride.

2.4-diaminophenol hydrochloride.

p-Dimethylaminophenol oxalate.

IIIa. Insoluble in alcohol:

p-Aminophenol sulphate.
5-Amino-2-cresol sulphate.
p-Methylaminophenol sulphate.
p-Dimethylaminophenol sulphate.

o-Methylaminophenol sulphate. p-Phenylenediamine hydrochloride.

Distinguishing Tests

A. Test aqueous solutions with litmus: Neutral or only faintly acid with Group II; Group III, and IIIa give markedly acid solutions (with the exception of pure p-aminophenol base). Test aqueous solutions for chloride, sulphate, oxalate and other common anions.

B. Treat 0.1 g. in 1 c.c. hot water with one or two drops of 10 per cent. sodium carbonate solution, let mixture stand a

few minutes to cool:

Group I. p-Hydroxyphenylglycine. Dissolves with effervescence; very little change on standing.

Group II. Hydroquinone, Chlorohydroquinone and Catechol. No effervescence; solution darkens slowly on standing.

Pyrogallol. No effervescence, solution

darkens rapidly on standing.

Group III and IIIa. All cause effervescence except pure p-aminophenol base.

Crystalline precipitates formed on cooling: Salts of *p-aminophenol*, 5-amino-2-cresol and o-methylaminophenol.

No precipitate on cooling: Salts of 2.4-diaminophenol, p-methylaminophenol, p-dimethylaminophenol, and p-phenylenediamine.

C. To 0.1 g. of sample in 2 c.c. of

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¹ Communication No. 73 from the Research Laboratory of the Eastman Kodak Company.

water add a few drops of 10 per cent. ferric chloride solution:

Group I. p-Hydroxyphenylglycine gives no color reaction in the cold; odor of

quinone on boiling.

Group II. Hydroquinone gives dark greenish precipitate of quinhydrone in the cold; strong odor of quinone on boiling.

Chlorohydroguinone gives reddishbrown coloration in the cold; odor resembling that of quinone on boiling.

Catechol gives a green coloration with one drop of ferric chloride; with excess a nearly black precipitate is formed; no odor is produced on boiling.

Pyrogallol gives intense reddish-brown coloration in the cold; no odor on boiling.

Groups III and IIIa. Salts of paminophenol and 5-amino-2-cresol give purple colorations in the cold; odors of quinones on boiling and the purple colors are not destroyed.

p-Methylaminophenol sulphate behaves similarly, except that the purple colora-

tion is developed more slowly.

Salts of p-Dimethylaminophenol give no color in the cold; the solution darkens on boiling, with formation of quinone odor.

With 2.4-diaminophenol hydrochloride an intense red color is developed in the cold; no odor is produced on boiling.

With o-Methylaminophenol sulphate a dark purple color is produced, turning to red-brown on standing or more rapidly on warming. No odor is pro-

duced on boiling.

With p-Phenylenediamine hydrochloride a deep green color is developed, followed immediately by a dull purple; on boiling, the color changes to a dull redbrown, and the odor of quinone is produced.

D. To 0.1 g. of sample in 1 c.c. of water add 2 c.c. of 5 per cent. silver

nitrate solution:

Group I. p-Hydroxyphenylglycine in suspension causes a black deposit in the cold which on boiling instantly becomes light brown, while the liquid rapidly acquires a purple color.

Group II. Hydroquinone gives a silky white precipitate in the cold, the odor of quinone is developed on boiling.

Chlorohydroquinone scarcely reduces

silver nitrate in the cold, but rapidly on boiling.

Catechol slowly reduces the reagent in the cold; no characteristic color or odor developed in boiling.

Pyrogallol causes instant reduction in the cold, giving a brown precipitate; no

odor produced on boiling.

Groups III and IIIa. Salts of paminophenol, p-methylaminophenol and 5-amino-2-cresol give purple colorations, with quinone-like odors on boiling.

Salts of p-dimethylaminophenol give no color in the cold; on boiling a brownish red color and the odor of quinone are

developed.

2.4-Diaminophenol hydrochloride yields an intense red color; no odor on boiling.

o-Methylaminophenol sulphate gives a yellowish-brown color in the cold, becoming reddish-brown on heating; no odor developed in boiling.

p-Phenylenediamine hydrochloride vields in the cold a transitory pale green color, followed instantly by a deep purple; no color change and no odor on boiling.

Specific Tests

Two reactions which should be performed with every developing agent are

Acetylation and Benzovlation.

In acetylation the substance is mixed with about three times its weight of acetic anhydride, together, if the developing agent be a salt of a base, with an equal weight of anhydrous sodium acetate, and the mixture gently boiled for a few moments over a flame. After the mass has cooled about ten volumes of water are added and the separated solid filtered off and recrystallized from alcohol or similar solvent.

In benzoylation (Schotten-Baumann process) the substance is mixed with about four times its weight of benzoyl chloride, and an excess of 10 per cent. caustic soda solution added, whereupon the mixture is vigorously shaken in a stoppered tube, cooling if necessary, and occasionally releasing any excess pressure by opening the stopper. Shaking must be continued until the irritating odor of the benzovl chloride has disappeared. Care must be taken that an excess of alkali is present at the end of

the reaction. The separated solid is then filtered off, washed with water, and recrystallized from acetone or other suitable solvent.

The derivatives thus produced possess characteristic melting-points, so that an identification can be definitely estab-

lished by their aid.

Group I. p-Hydroxyphenylglycine dissolves readily in dilute sodium carbonate, sodium hydroxide, sodium sulphite, or ammonia; also in dilute mineral acids, but not in dilute acetic acid. When pure it crystallizes in colorless leaflets, melting indistinctly with decomposition above 200°.

Group II. The four substances described in this group all form bright yellow water-soluble compounds with sulphurous acid (or sodium bisulphite

and dilute acid).

Hydroquinone crystallizes readily from water in colorless needles, melting at 160°. It boils at 285°. The vapor is almost odorless. It is insoluble in benzene. Quinhydrone, precipitated by a cold acid solution of ferric chloride, or of potassium bichromate, melts at 171°. Quinone formed by the action of an excess of acid bichromate, melts at 116°. The diacetyl derivative melts at 123°; the dibenzoyl derivative melts at 199°.

Chlorohydroquinone is too soluble in water to crystallize from aqueous solution. It dissolves readily in warm benzene. It melts at 106° and boils at 263°. The vapor has a distinct phenolic odor. The diacetyl derivative melts at 99°. Chloroquinone, produced by oxidizing with acid bichromate, melts at 57°.

Catechol forms feathery needles which melt at 104° and boil at 245° and are extremely soluble in water. It is readily soluble in hot benzene, sparingly in cold. It possesses an odor resembling that of pyrogallol. On treatment with bromine in carbon tetrachloride solution, hydrogen bromide is evolved, and a tetrabromo derivative melting at 192° is produced. The diacetyl derivative melts at 63°; the dibenzoyl derivative melts at 84°.

Pyrogallol is extremely soluble in water. It is slightly soluble in hot benzene, almost insoluble in cold. It melts at 133° and boils at 293°. It possesses

a peculiar and characteristic odor. Its aqueous solution gives a blue precipitate with ferrous sulphate. The triacetyl derivative melts at 161°, the tribenzoyl derivative melts at 89°.

Groups III and IIIa. p-Aminophenol and its salts. The free base crystallizes from water in leaflets, melting with decomposition at 184°, soluble in about 100 parts of cold water. It is moderately soluble in hot alcohol, sparingly in ether. The hydrochloride crystallizes in prisms, and is sparingly soluble in concentrated hydrochloric acid. The sulphate, crystallizing in fine needles, is less soluble in cold water than the hydrochloride, but the hydrochloride is precipitated from an aqueous solution of the sulphate on adding concentrated hydrochloric acid. On adding to a cold slightly acid solution an excess of sodium acetate and then a few drops of benzaldehyde, the pale yellow benzylidene derivative is soon precipitated, which crystallizes from methyl alcohol in needles, melting at 183°. The diacetyl derivative melts at 150°; the dibenzoyl derivative melts at 234°.

5-Amino-2-cresol and its salts resemble p-aminophenol and its corresponding salts very closely in solubility and chemical behavior. The free base crystallizes from water in flat needles, melting with decomposition at 176°. The hydrochloride crystallizes either in needles, or, less frequently, in leaflets. The sulphate crystallizes in fine needles. On oxidation with acid bichromate it yields toluquinone, melting at 68°. The benzylidene derivative is markedly less soluble than benzylidene-aminophenol in methyl alcohol, from which it crystallizes in leaflets, melting at 208°. The diacetyl derivative melts at 103°; on gentle hydrolysis with alkali it yields the monoacetyl derivative, melting at 179°. The dibenzoyl derivative melts at 194°.

2.4-Diaminophenol is met with only as the hydrochloride. The free base is not precipitated from solution on addition of sodium carbonate; the neutralized solution darkens very rapidly in air. The hydrochloride is sparingly soluble in concentrated hydrochloric acid. Attempts to prepare a benzylidene derivative led to a smeary yellow product.

The triacetyl derivative melts at 180°; the tribenzoyl derivative melts at 231°.

p-Methylaminophenol is met with only as the sulphate, which crystallizes in fine needles. The free base is fairly readily soluble in cold water, but is precipitated on neutralizing a cold saturated solution of the sulphate with sodium carbonate; it melts at 85° and is extremely soluble in ether. On allowing a solution in an excess of sodium hydroxide to stand in air, a dark color rapidly develops, accompanied by a characteristic odor not unlike that of a trace of pyridine. On adding sodium nitrite solution in slight excess to a solution acidified with sulphuric acid, the sparingly soluble nitroso derivative separates in colorless needles, melting at 136°. The perfectly pure monomethyl compound yields no benzylidene derivative on treatment with sodium acetate and benzaldehyde, but technical samples are rarely entirely free from salts of p-aminophenol, which is converted by benzaldehyde into the insoluble benzylidene p-aminophenol. A good technical sample should be completely soluble in three parts of concentrated hydrochloric acid. The diacetyl derivative is insoluble in cold water and melts at 97°; on gentle hydrolysis by warming with dilute alkali this is converted into the mono-acetyl compound (soluble in alkali and precipitated by acid) which melts at 240°. The dibenzoyl derivative melts at 173°.

p-Dimethylaminophenol. The sulphate crystallizes in hexagonal tablets which are extremely soluble in water. oxalate is moderately soluble in water and alcohol; it melts at 187-191°. free base is fairly readily soluble in cold water; it melts at 75° and is extremely soluble in ether. On allowing a solution in sodium hydroxide to stand in air, the same dark color and pyridine-like odor are developed as with the monomethyl compound. On adding sodium nitrite to a solution in dilute acid, a reddish-brown coloration is formed, with evolution of gas. On adding a saturated solution of potassium ferrocyanide to a fairly concentrated solution in dilute sulphuric acid, a white crystalline precipitate of the acid ferrocyanide soon separates. It forms an acetyl derivative, melting at 78°, and a benzoyl derivative (soluble in dilute acid), which melts at 158°.

o-Methylaminophenol. The sulphate crystallizes in stout needles which are extremely soluble in water; the free base, which is slightly soluble in cold water but readily so in hot water, crystallizes in leaflets, melting at 96°. It dissolves in alkali, forming a solution which slowly darkens to a dull green color on standing in air, giving a pyridine-like odor, but more slowly than the para compound. The free base and its sulphate are completely soluble in three parts of concentrated hydrochloric acid. On adding sodium nitrite to a solution in dilute acid, the nitrous compound is precipitated in colorless leaflets which melt with decomposition at about 130° after darkening from 120° onward (the melting-point is rather indistinct and depends upon the rapidity with which the bath is heated). The derivative obtained on acetylation is a liquid which dissolves in cold water; on gentle hydrolysis by warming with dilute alkali it yields the monoacetyl compound (soluble in alkali and precipitated by acid), which melts at 150°. The dibenzoyl derivative melts at 113°.

p-Phenylenediamine. The hydrochloride crystallizes in leaflets which are readily soluble in water. The free base, melting at 140°, is moderately soluble in cold water and sparingly in ether. On adding to a cold dilute solution an excess of sodium acetate and then a few drops of benzaldehyde, the pale yellow dibenzylidene derivative is precipitated, this crystallizes from methyl alcohol, in which it forms a bright yellow solution, in thin leaflets, melting at 138°. Both the diacetyl and dibenzoyl derivatives melt at temperatures too high for convenient measurement.

Quantitative Methods

It frequently happens that photographic developers placed upon the market consist of mixtures of developing agents or of impure simple substances, so that it may be necessary to separate and estimate the constituents of a mixture or to determine the purity of a sample of a single substance.

Group I. No direct method for determining the purity of a sample of p-hydroxyphenylglycine is available. An ash determination should be made, and the amount of matter insoluble in dilute sodium carbonate estimated. If a sulphite be present, the sulphurous acid liberated by mineral acid should be determined by the method indicated below.

Group II. All the substances in this group should leave no ash on ignition; if there be any, it should be estimated. Likewise, all should dissolve in water and in ether without residue, and should leave no considerable residue when the main constituent is volatilized under atmospheric or reduced pressure.

The melting-point forms a fairly satisfactory criterion on the purity when the sample is found to be completely soluble

in ether.

The porportion of hydroquinone in a sample of chlorohydroquinone may be estimated by isolating and weighing the matter insoluble in warm benzene.

Groups III and IIIa. Water-insoluble material and ash should be estimated; in Group III, the amount of matter insoluble in alcohol should also be determined. The proportion of chloride sulphate, sulphite, etc., should be determined; and in certain cases it may be well to estimate the total nitrogen by the Kjeldahl method, making certain, of course, that free ammonium salts are absent.

It is important in all cases to determine the amount of salts of p-aminophenol or aminocresol present, both in samples consisting principally of one of these compounds and in samples of methylated derivatives. The procedure is as follows: Ten grams of the sample are dissolved in about 150 c.c. of cold water (or, in the case of the free base, dilute hydrochloric acid). Heating must be avoided, since this may cause impurities to enter into solution which do not again separate in cooling. A slight excess of sodium acetate is then added, and to the cold solution about 10 c.c. of benzaldehyde are run in. When the sample contains a relatively small proportion of aminophenol, as in samples of p-methylaminophenol sulphate, the amount of benzaldehyde should be considerably

reduced. After standing over night the mixture, which should still contain excess of benzaldehyde, is filtered by suction and the solid well washed with water, dried in the steam oven and weighed. A Gooch crucible answers satisfactorily.

The following factors are applied for

expressing the result:

As p-aminophenol hydrochloride		0.738
As p-aminophenol sulphate .		0.802
As p-aminophenol base	-11	0.554
As 5-amino-2-cresol hydrochloride		0.756
As 5-amino-2-cresol sulphate .		0.815
As 5-amino-2-cresol base		0.584

For the remaining substances in this group the simple though non-specific total nitrogen content must be determined and the assumption made that all the nitrogen is in the form of the pure substance.

Inorganic Radicles. When an ash has been found and shown to consist of a salt of an alkali metal, a weighed sample of the substance should be ignited in a platinum crucible and the residue repeatedly evaporated to dryness and heated to redness after adding a few drops of 20 per cent. sulphuric acid, in this way the metal is completely converted into the sulphate.

Chlorides and bromides should be determined by the Volhard method. Direct estimation of alkali carbonate is difficult or even impossible in some instances, and may have to be effected

by difference.

Sulphites are test estimated by distilling an acidified solution of the sample into alkali and titrating the distillate against standard iodin solution, running the sulphite into the iodin. A regular Kjeldahl distillation apparatus answers well for the purpose.

Typical Analyses

For obvious reasons the sources of the material used for these typical analyses are not indicated, they represent a selection from a very large number performed in the years 1916–1918.

"MQ" Developer Tube (April, 1916). The total weight of material in the compartment containing the developing agent was 0.6276 g. This was placed on

a filter and well washed with ether; the ethereal solution, on evaporation, left pure hydroquinone; the insoluble residue, when dried at 100°, weighed 0.1241 g. and was found to consist of pure *p-methylaminophenol sulphate*. The hydroquinone was not weighed, but estimated by difference.

"MQ" Developer Tube (April, 1916). A similar analysis on another tube showed total weight 0.5113 g.; ether soluble material consisted of pure hydroquinone; ether insoluble material weighed 0.1120g. and consisted of technically pure p-amino-

phenol hydrochloride.

Developing Agent (March, 1916). The material was a light brown powder of rather moist appearance. It contained no substance soluble in ether, but dissolved partially in alcohol, the alcoholic extract depositing p-aminophenol hydrochloride on evaporation, 2.000 g. were boiled with alcohol and filtered on a weighed Gooch crucible. The insoluble residue was well washed with hot alcohol and dried to constant weight in vacuo over sulphuric acid. It weighed 0.728 g. and consisted of pure starch. The filtrate was evaporated to dryness, and the residue dried at 115°; it weighed 0.998 g. Another 2.000 g. sample was heated in the oven at 115° to constant weight; it lost 0.308 g.

The material thus consisted of

p-aminophe	enol	h	ydr	och	lor-	
ide .						49.9 per cent.
						36.4 per cent.
Moisture						15.4 per cent.
					-	
						101.7 per cent.

"Metol" (April, 1918). This consisted of technical p-aminophenol hydrochloride, without a trace of methylated

product.

"Metol" (April, 1918). The label claimed the contents to be the "Hydrochloride of Methyl-p-amino-m-cresol guaranteed 96.3 per cent. pure." The material consisted entirely of 5-amino-2-cresol hydrochloride, without a trace of methylated product.

"Metol Substitute" (April, 1916). The material was first extracted with ether, the filtrate was found to contain only pure hydroquinone. 2.7654 g. gave

0.5122 g. of hydroquinone, or 18.5 per cent. The residue showed the presence of sulphite and sulphate as the only acid radicles; on ignition a residue consisting of sodium salts was left. *p-Methlaminophenol* was found by the usual methods, and the behavior of the material led to the suspicion that canesugar was present. This was confirmed by boiling with strong hydrochloric acid, when the characteristic brown color and odor of caramel were developed. Further examination failed to show the presence of other substances.

The portion insoluble in ether was dissolved in water and diluted to 50 c.c.; this solution in a 20 cm. tube gave a rotation of 2.90°, using mercury green light, corresponding to 0.932 g. canesugar in the sample, or 33.7 per cent.

Another portion of the original sample was ignited in a platinum crucible and the residue converted into sodium sulphate. 1.3604 g. gave 0.5310 g. of sodium sulphate, corresponding to 34.7 per cent. of sodium sulphite. (The sulphurous acid content was not determined as a check.)

For estimating the *p-methylamino-phenol sulphate*, a portion was digested with sulphuric acid, and the nitrogen determined by the Kjeldahl process; 1.4880 g. required 8.6 c.c. of $\frac{N}{10}$ acid, corresponding to 0.148 g. *p-methylamino-phenol sulphate*, or 10 per cent.

The material thus contained:

Hydroquinone	18.5 per cent.
Cane-sugar	33.7 per cent.
Sodium sulphite	34.7 per cent.
p-Methylaminophenol sul-	
phate	10.0 per cent.
	96.9 per cent.

"Metol Substitute" (June, 1916). The material on treatment with ether yielded a soluble constituent which was identified as pyrogallol; the residue which contained no nitrogenous matter, consisted entirely of sodium sulphite; the ethereal extract from 5.1215 g. gave, on evaporation, 1.3050 g. of pyrogallol or 25.5 per cent; the residue was acidified and the sulphurous acid distilled into alkali, which was then diluted to 200 c.c. Of this solution 15.9 c.c. were required

by 60 c.c. of standard iodin solution equivalent to 50.0 g. sodium sulphite per liter, corresponding to a total of 3.773 g. sodium sulphite, or 73.8 per cent. Another sample was ignited with sulphuric acid; 1.2730 g. gave 1.0455 g. sodium sulphate, corresponding to 0.9280 g. sodium sulphite, or 72.9 per cent.

The material thus consisted of:

98.9 per cent.

Developing Agent (July, 1916). Ether dissolved out a small amount of dark smeary material, which was not further investigated. The residue in further examination was found to consist of impure p-aminophenol hydrochloride mixed with lead chloride and a small amount of lead sulphate. The lead was determined by ignition with sulphuric acid: 1.7130 g. gave 1.1270 g. of lead sulphate, or 0.429 equivalents of lead per 100 g. of sample. In another sample, chlorine and nitrogen were determined by collecting in alkali the gases evolved on heating with sulphuric acid in the Kieldahl process; 1.6070 g. were heated with 25 c.c. of sulphuric acid, the gases evolved during the early stages of digestion being absorbed in 25 c.c. of 10 per cent. alkali. This was diluted to 100 c.c., 10 c.c. of the solution required 22.6 c.c. of N silver nitrate after deducting the blank test, corresponding to 0.710 equivalents of chlorine per 100 g. of sample. ammonia required 46.4 c.c. of N acid, corresponding to 0.289 equivalents per 100 Deducting, this leaves g. of sample. 0.421 equivalents of chlorine combined as lead chloride, again deducting, there remain 0.008 equivalents of lead sulphate. Composition of 100 g. of sample:

The above analysis is of course accurate only to about 1 or 2 per cent., especially in the figure for *p-aminophenol*, since all nitrogenous matter has been

calculated as *p-aminophenol hydro-chloride*.

Developing Agent (September, 1916). This material was stated by its label to be "identical to Metol." On treatment with ether a considerable quantity entered into solution; the etheral extract, on evaporation, left hydroquinone: 1.2140 g. gave 0.6300 g., or 52.0 per cent. of hydroquinone. The insoluble portion was found to contain sulphite, sulphate, carbonate, iodide, sodium, potassium and a salt of *p-methylaminophenol*.

Iodin Estimation: 0.8996 g. gave 0.0613 g. AgI. Expressed as potassium iodide, 0.0487 g., or 5.4 per cent.

Sulphite Estimation: 1.2140 g. required 36.0 c.c. of standard iodin solution (1 liter corresponding to 50.0 g. of anhydrous sodium sulphite) corresponding to 0.179 g., or 14.7 per cent. sodium sulphite.

Alkali Metals: 0.2135 g. gave 0.0512 g. mixed sodium and potassium sulphates, this corresponds to 5.4 per cent. potassium iodide plus 14.7 per cent. sodium sulphite, plus 3.7 per cent. sodium carbonate.

Nitrogen Estimation (Kjeldahl) 0.6030 g. required 11.5 c.c. of $\frac{N}{10}$ acid, corresponding to 0.198 g., or 32.8 per cent. of p-methylaminophenol sulphate.

Composition:

108.6 per cent.

Metol Substitute (June, 1918). The material was extracted with ether, which, on evaporation, left no residue. Methyl alcohol dissolved a considerable proportion; the filtrate, on evaporation, left a residue consisting of pure ammonium p-toluenesulphonate, which was identified by the preparation of the corresponding sulphuric chloride and sulphonamide, both of which had the correct meltingpoints. Further examination showed the presence of a salt of p-methylaminophenol and a small amount of some sodium salt. Sulphate was found to be present.

As ammonium *p*-toluenesulphonate has no developing action, the principal interest lay in the proportion of p-methlaminophenol present. A weighed quantity was accordingly dissolved in water and heated to boiling. To the boiling solution an excess of sodium carbonate solution containing a small amount of sodium sulphite was added, and the mixture boiled until every trace of ammonia was expelled. The residue was then immediately acidified with dilute sulphuric acid, and the nitrogen determined by the Kjeldahl method: 0.1200 g. required 8.5 c.c. of $\frac{N}{10}$ acid corresponding to 0.146 g., or 12.0 per cent. of methylaminophenol sulphate. The material thus contained 12.0 per cent. p-methylaminophenol sulphate, the remainder consisting of ammonium *p-toluenesulphonate* together with a small proportion of sodium salts.

Adulterants. These are of such diverse nature that it is impossible to suggest any general lines of examination. Among the adulterants and useless substitutes the following have been encountered: starch, cane-sugar, citric acid, sodium formate, potassium oxalate, Rochelle salt, potassium ferrocyanide, boracic acid, borax, potassium bromide, potassium iodide, potassium nitrate, sodium chloride, sodium sulphate, sodium sulphite, sodium bisulphite, sodium sulphide, sodium hydroxide, sodium carbonate, ammonium chloride, ammonium sulphate, calcium sulphate, magnesium sulphate, lead chloride, and lead sulphate.

GETTING MORE BUSINESS

IV "FRONT"

By J. CLYDE WILSON

N the hotel business, that part of the house with which the public comes in contact is known as "front"; the same is true in the theatrical business. In a similar way, that part of the studio fitted out to receive the public, the reception room, might fittingly be termed the "front." In more than one sense it is the front. We sometimes hear it said, slangily, that a man "puts on a good front." The meaning is obvious. In the photographic business the reception room is the salesroom, and in most business places, whatever other part of the institution is allowed to run down, the display room carries the reputation of the house with all the ostentation needed to make "a front."

Most of us sense, in some degree, the value of good appearance; but when it comes down to the point of application of what we know, right at home, in our own business, we are inclined to let well enough alone and not seek an improvement. Yet every single one of us draws his first conclusions—pretty hard ones

to shake, too—from appearances. For instance, someone asks if so-and-so is a good photographer. The one asked has no direct experience, so what does he reply? "I guess so," he says. "He has a nice-looking place over on the avenue, and he seems to be up-to-date—Turkish rugs, period furniture—and possesses all the earmarks of the progressive, successful manager." These outward aspects are a gauge of calibre.

This measuring of values by comparison goes constantly on, and from childhood on through the years we take great pleasure in sizing up our surroundings and drawing conclusions from them. So when we go into a photographer's studio, our previous estimate is strengthened or weakened according to what we see there. Nor does this stop with the appearance of the premises. Even the dress and looks of the attendants does not settle it. There is an unseen factor which plays the most important part of all and it may be termed atmosphere.

There is a certain restaurant in the

city where I live which has been fitted out elaborately at great cost. It occupies a most favorable location on one of the principal corners of the chief thoroughfare. So far as appearances go it fulfils in a stereotyped way every law governing the importance of this factor in business. It is kept scrupulously clean, everything works like clockwork. The system seems beyond criticism, but it has failed in two years to draw anywhere nearly as large a patronage as it would seem to deserve. In contrast with this, when in Pittsburg a couple of years ago, a friend took me up a dismal back street, one noon, to a restaurant that was almost its antithesis. It was in an old building. There was no marble in its interior, which was merely painted, but it was filled to capacity. The reason was plain. In the palatial restaurant above mentioned the purpose of all the ostentation was too plainly evident. It was a money-making machine and the works showed through. The employees always had one eye out for the boss. I have little doubt they were underpaid. If your order came out wrong, you had an argument to get it right. The manager had to be called. It was palpably evident the management was less concerned with what was served than with what was taken in. In the little unpretentious restaurant, which by the way was run by a couple of women, there was a conscientious effort to please the patron. When you ordered roast beef, and forgot to specify it, the waitress asked if you wished it wellbrowned, outside or inside cut, with or without gravy. Good humor pervaded the place, and was reflected in the faces of the help and in their manner. They joked pleasantly with the floor manager, when not engaged, and talked with the customers who wanted to pass the gossip of the hour. The whole atmosphere was tempered by the attitude of the management. This was good business-and no system, however perfect it may be, is a good substitute for goodspirited service, touched with a regard for the very human whims of those served.

This is just as true of the studio as it is of a restaurant. In no business, per-

haps, do people express so much whimsicality as is shown when securing an order of pictures of themselves. There is not a photographer of any experience who does not know this, whether he is at the top or bottom of the profession. The selection of proofs is always full of surprises. So handling the reception room requires almost superhuman tact and judgment, if the work is to be effectively done. You can make rules for almost every other phase of the business but this. Here a keen sense of character, resourcefulness, and the best of temper is imperative. It is not easy to resist sneers and abuse gently. It is not easy to maintain a pleasant, sympathetic manner when you are being severely criticized. That is why a good receptionist is a rare find. Only character, a strong mind and will, can overcome a temptation to return abuse in kind. But the receptionist is working in the interest of the business, and whatever is said by patrons is usually not personally intended, but rather merely the reaction of disappointment. We all have fancied ideas of how we look that are sadly exaggerated. When we see ourselves as we are, in the proofs, our delusion is exploded and in our disappointment we are loathe to admit the fault is not the photographer's. whoever represents the photographer catches it. But there are compensations. Is there any such "grand and glorious feeling," as cartoonist Briggs calls it, as that felt when a patron does secure a picture that pleases. Your virtues are sounded to the four corners of the town and beyond. The whole family and all of the relatives come down for a sitting. Verily, life does seem worth living then.

There is nothing goes so far to fore-stall disappointments such as have been mentioned as selling the patron thoroughly in advance. It is harder to think evil of a good man than of a bad. There are two ways to look upon an unsatisfactory result. The patron says, disgustedly, that the photographer is "no good," or he blames himself for taking a bad picture. If the photographer's reputation rests secure upon past performance; if he can convince the patron

by pictures displayed, he is a workman of more than ordinary ability, he cannot be so ready to shift all of the responsibility for failure upon the photographer's shoulders. But if the sitting was preceded by a sad experience with the receptionist; if an argument with another patron was witnesed; one was kept waiting or neglected; in short, if the initial experience was one to cast aspersion upon the photographer, the patron places her order with some misgivings and is critically inclined from the outset.

The photographer should guard against these things. They leave a bad impression. If he can do so conveniently it is well to show proofs in a room apart where criticism will not be overheard. There certainly will be criticism in nine cases out of ten. It is a fact, which must not be overlooked. There is nothing that pleases a patron more than individual attention. The more highly regarded the phototrapher, the more this will be valued, but it always has some effect. We all like to feel we have been singled out and that we are important enough to receive special honors. Watch how one's chest swells when the distinguished speaker of the evening nods to him in the crowd. If you can meet patrons tactfully and pleasantly in the reception room, be sure and do so whenever you can. If you cannot, keep strictly out of sight.

A photographer I knew, out west, was a past-master at this art. If he did not know the patron he made his acquaintance in a most ingenious way. didn't ask if he had been waited upon. He would march out of his private sanctum casually with a small framed picture in his hand. He was a large, impressive man, with a great deal of force of character and a very matter-offact way, which made it possible for him to pick up a conversation with anyone easily without being resented. He would strut over near a patron and stand there apparently quite oblivious of him, hold the framed picture at arm's length apparently admiring it privately without realizing where he was. It might be a reproduction of a Reynolds or a Gainsborough; it might be a copy of a recent painting; or it might be one of his

own pictures. No matter. It offered a means to break the ice and create an interest in the subject he expected to dwell upon. After he had admired the picture a moment he would look around for sympathy and, apparently seeing the nearby patron for the first time, would say: "Wonderful style that fellow Gainsborough had. Isn't that a gem?" Out goes the patron's chest. Surely it was. "Notice the sweep of that curve?" he would go on. This was something new to the patron, but he was saying inwardly, "This man is a real artist." Our friend photographer would drop into the divan beside the patron and talk for a few moments about pictures. The patron listening attentively, and agreeing to everything-no chance for negative ideas here. He had to act as though he was in agreement, while in fact he was learning. He was being sold on the idea that this photographer was an artist who knew art. How then could he, who did not, afterward take issue successfully with him about the results? It takes a fine kind of artistry to carry this kind of an impression, but the man who has made photography his life work and is imbued with his subject should find it second nature. Nor should it end with the sitting. Take the patron into your private room afterward and show him other Gainsboroughs. Make art interesting to him. Tell him of a picture you saw down the street in a certain art store window. Ask him to stop and look at That is the way to sell photographs by indirection. It is salesmanship by suggestion. The important thing to the patron is not the cost of the pictures he buys or the style. It is the amount of satisfaction they give him, just as it is in every business. The amount of satisfaction depends upon what he thinks of you and your establishment. That is why so many photographers cultivate a definite individuality. It is a salable asset. Individuality is something you cannot buy everywhere. It has a particular value, accordingly as the patron appraises it. If he thinks you a freak it may be worthless. If he thinks you an artist it may be priceless.

To sum it up then, "the front" your business puts on is nearly as important

as the work you turn out. Of course, no amount of artistry in selling will cover up inferior workmanship. is self-evident. Putting on a front, does not mean camouflaging inferiority. It cannot be done. It does mean selling your excellences, the ideas that make your work superior, so the patron will know why it is to his interest to patronize you. There are lots of people who will tell you frankly they cannot see where Mr. High-tone Photographer's work is any better than Mr. Low-Brow Photographer's. They are sincere in They do not see. saving this. They know the photographers see. difference. If your work is better, then you must sell it on that basis; but the method used must be one that will carry conviction. To say your pictures are miles ahead of the back-street man's means nothing if the patron cannot understand why. But when you unearth a new world of beauty by drawing attention by subtle means to what you know about what makes good pictures, you at the same time create increased respect for your own abilities and for your work.

Therefore the place to put your cheap help is not "in front" but behind. The cleverest brains you can secure are none too good for your reception room. Because of their intuitive sympathy and their ability to quickly catch a change in mood, women make excellent receptionists. But they must be good-tempered, with an infinite amount of patience, and possessed with a shrewd business sense. It's a hard combination to find. If you have a good one, better marry her so she won't get away.

TALKS ON COMPOSITION IN PORTRAITURE

By J. S. C.

OMPOSITION in a picture, while of prime importance, is most difficult to characterize, and artists will agree that it is subject to no fixed rules. While there are certain fundamental principles that should be carried out, such as balance, rhythm, harmonious arrangement of lines and spots, etc., each individual must depend largely upon his own personal feeling as to what constitutes a pleasing decorative effect. So long as he has intelligently and deliberately worked for a certain result, and has succeeded in telling his story by simple and direct means, and brought the whole thing to a unit, he may have achieved a good composition, even though he may have disregarded some of the lines most generally accepted as rules and principles.

In the realm of art there are still countless untried possibilities for the clever hand and imaginative eye. The original mind is invited to experiment and works out something new and individual. Only let no one deceive himself into believing that every result of such effort is a success, and it is not only prudent but essential that he should keep one hand tightly grasped about the known and tried, while he reaches out with the other into the experimental and unknown. Else he will find himself as one floundering about in deep water before he had learned to swim; and, so far from being admired for his daring, he soon exhausts himself and presents a sorry spectacle to onlookers.

If, perchance, some kindly individual comes to his rescue, to haul him back to shore, or to offer him suggestions for keeping afloat, he may be foolhardy enough to say, "Keep away! I have determined to swim in a new and original manner, and will have none of your old-established methods. They may do well enough for the rest of you, but I propose to show you what a genius can do!" But the laws of gravitation drag him down, and he proves that originality and bumptious ignorance are terms that are often confused.

In the long catalogue of photographic workers how many instances do we find where error has been committed in this respect, and the eve has been tortured and the brain bored by "original" ideas, that were oftentime palpable accidents, or the offspring of spoiled negatives, that were sufficiently bizarre or sensational to cause one to stop and wonder what was the meaning when there really was no meaning at all? Or sometimes things are dragged before one's notice that are drearily commonplace, just because their "creator" had in mind the work of some eminent photographer and saw a fancied resemblance between the dulness of his own production and the subtility of the other.

If a man, endowed with the insight and skill of the artist, is fitted by training and ripened by experience he may find infinite lattitude for the exercise of his imagination and his technic. Undoubtedly this is most true in lines outside of portraiture. In landscape, genre and figure pieces, whether illustrative or purely decorative, the artist often roams at his own sweet will, and so long as he has a definite purpose, coupled with the power of expressing it, he may take large liberties with facts; while the greatest charm of some art is its suggestiveness of something entirely different from the actual subject treated.

But in portraiture this is different. Everything is subject to the arbitrary law of reproducing the likeness, and every means must be employed to portray the character of the subject. The purely imaginative faculty must give way to the perceptive and interpretative, and the artist should aim at fidelity to his subject first of all and make his own individuality secondary. True, he should endeavor to be individual in his interpretation; but to flaunt his individuality in one's face so that one loses sight of the subject, while it may be a clever technical performance, is bad portraiture.

And truly there is nothing grander or nobler in art than the rendering of the aspect of a human face and figure so powerfully and with such subtility that one may read the soul behind them. Of course, in many ways the artist has the advantage over the photographers. He

takes his time to study his sitter carefully, to determine his most favorable expressions and attitudes. He may employ many hours and even days in going over parts of his picture, subordinating ugly details, and accentuating pleasing ones, until finally he arrives at a composite of happy expressions that reveal (or should reveal) the sitter at his Then, too, he may revel in the potent charm of color, and the man with the camera, as well as any other worker in monochrome, must take off his hat. In a later article I may discuss the work of the three color process, and color values in photography, but space will not permit at present. The average photographer finds himself handicapped by the lack of time to study his sitter. If he be a very busy man, and is doing work at "popular" prices, he finds one customer treading so closely on the heels of the other that he is apt to feel that he can give but a few moments to a pose, whatever be his inclination to linger and work out the possibilities of the subject. Again, if he is fortunate in having a clientele of wealth and taste, and receives prices that permit him to pay due attention to every detail of posing, lighting and arrangement, he may still find many results unsatisfactory, and that, in spite of all his endeavors, the camera has caught his sitter at an inopportune moment and registered something that was hard, wooden or unpleasing in some particular.

Still, the one important thing, after having equipped yourself with training, knowledge and a mastery of your medium, is the study of your subject. The sitter comes to you as so much raw material more or less pliant in your hands, to mould into whatever you will. It is your province to read and understand that sitter and determine his strongest points of character. You are to gain his confidence and put him at his ease, so that he forgets all about himself, if possible, and find what attitude or expression best reveals his inner self. Having determined that, your judgment, sympathy and imagination are brought into play, to arrange all the accessories of drapery, grounds, furniture, etc., so that, if possible, they will have an intimate connection with the character as



BY FRANK SCOTT CLARK DETROIT, MICH.



revealed in the pose. Here is where the artist in you shows himself or is conspicuous by his absence. This is the fascinating thing about portraiture and in photography especially is of prime importance, as the whole thing must be arranged as nearly right as possible before the exposure is made.



I know that it is the custom of some photographers to ignore certain things in the arrangement, depending on an after-process on the negative with chemicals and etching knife to eliminate certain things that should have been attended to before the plate was exposed. Now, while it is not only possible but often advantageous and even necessary to treat the negative, after or during development, to eliminate certain defects, I believe most firmly that everything possible should be done to establish the right conditions before pressing the bulb. This business of manipulating the negative is full of risk even in judicious hands. If it is done well it may be termed an artistic success. If it is poorly done it is simply "faking,"

Let us consider for a moment the treatment of the subject in the photograph here reproduced. To a great many photographers it may seem to be a first-rate thing, and to contain many pleasing qualities. And truly, if no worse things were ever produced, the average photograph would be raised immeasurably in standard. In fact, I have selected it because of certain good qualities which it possesses, as well as points that might be criticised.

The lighting is fairly soft and brings out good values on the flesh and drapery. The latter maintains the quality of a white dress, and is neither chalky nor muddy, while the gentle shading down toward the bottom of the picture prevents the eye being carried very far from the face by the brilliancy of light. The likeness is apparently very well preserved, and there is something about the arch expression that is very charming.

I would venture to say that the majority of people would accept it, pay for it and go home pleased. But, regarding it as an average good commercial photograph, let us study it a bit, to determine wherein it is weak, and whether there are not possibilities in the sitter

for a really fine picture.

To begin with, the young lady is thoroughly attractive, and while not absolutely beautiful, has a bright, winsome face that possesses something that far transcends mere prettiness, viz., character. Her hair is soft and careless, her gown dainty and simple, and is well suited to the figure, which is graceful in its lines and proportions. The arms show especially good lines and curves which might be utilized to great advantage. It is easy to see that she is a person of temperament and can be serious, thoughtful, merry, roguish or coquettish, and in her budding womanhood might be made a fascinating type. How much of this has the photographer realized in his picture? Make a circle surrounding the head and hand against the cheek, and you have the entire idea that has been expressed. Shut out everything else and study it for a few moments. remove the mask from the rest, and what do vou find? The head is slightly inclined, resting on the hand, and you expect to find the elbow resting on a table, perhaps in front of the figure, the other hand resting on the pages of a half-opened book, or toying with a fan or some other trifle. But you find that the figure is not even seated, which you might expect from the position of the left arm. It is hardly inclined, and certainly not enough to warrant the head

being supported in that fashion.

The other hand, which you could imagine coquettishly holding a fan, is simply grasping the back of the chair and practically forms a right angle with the other arm, and both serve to lead the eye to the dark chair, which, by its size and being the strongest dark in the whole picture, takes the attention from the head, and unbalances the whole picture. This is further accentuated by the lace sleeve falling over it, which forms a spot against the black, something like the claw of a lobster. The right hand is spread out in an ungraceful shape, which is further emphasized by the shadow of the belt coming each side of it.

In fact, the whole thing is made to look posed, and is lacking in spontaneity. The head, instead of being supported by the arm, seems to be pulled down by it toward the chair. The chair itself, while not bad for some things, being of a plain simple pattern, is out of keeping with the

subject, and seems hard and severe. It might do very well for a stronger, more rugged type of person to be seated in, but jars in its present combination.

The most serious transgression, however, is in the selection of background. While it does not greatly offend in tone, and is very little cut up, it is palpably part of an outdoor effect, and this is, of course, incongruous with the idea of the rest. I hope sometime to devote a chapter to backgrounds, and feel justified in saying that my convictions will not move me to flatter the taste of many photographers in their selection of grounds.

In my next article I shall endeavor to suggest certain poses that would be effective with this subject. I should be glad to have photographs sent to me by the readers, with questions that would suggest different lines of discussion. As I am not attempting to cover the ground systematically, but rather speak as the spirit moves, I should appreciate any suggestions of this sort from you. It may appear that I have dwelt too much on trifles, but as one of the great masters once remarked, "Trifles make perfection and perfection is no trifle!" As I remarked before, you are privileged to disagree with me if you choose.

WORRY, NOT WORK, KILLS MEN

ORRY kills; work never. When we say that a man is suffering from overwork, we mean from over-worry.

To a normal man or woman, work stimulates and invigorates. It is a tonic just as idleness is a disintegrating disease.

God bless the man who invented work! It is a cure for most ailments; it banishes the blues, helps digestion, and builds character.

The man who has nothing to do is miserable and usually a nuisance to society. He never helps in the building of a town; he finds fault with everything and everybody, and ends by hating himself worse than everybody else hates him.

Some people are anticipating trouble all the time, and for that reason worry incessantly. Some people think they cannot help worrying; but they have never tried crushing it under foot.

Worry will turn the sweetest cream sour. Worry will bring wrinkles, dim the eye, and rust the brain.

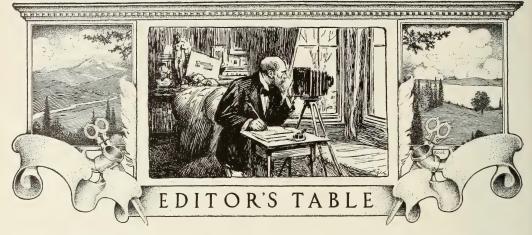
Worry never earned a dollar or paid a bill

Worry never softened the heart of a

creditor or paid a note.

Work is the wellspring of genius;

worry is the source of failure and defeat. When the day's work is over, don't worry. Go to sleep and let the other fellow do the worrying.—EDWARD N. DINGLEY in *The Printing Art*.



SAVING A LIVING

THESE are times for great, pressing, and wise economy all along the line.

There are hundreds of successful photographers—men who are making at least a comfortable living from their profession-and there must be hundreds more who find that it is all they can do to scrape along. In bad times they seem just to hang on to their businesses by the skin of their teeth, and in good times they are very little This is not the fault of their work, perhaps—lots of men are making money with cheap work in cheap districts-it is more often the fault of a little looseness in business management. Many ways are ever being recommended for the increasing of business, and handin-hand with them should go methods of preventing leakage. Mr. Clyde Wilson's series of practical articles in "Getting More Business" are timely. what we have seen in not a few studios we know that much money is in the aggregate wasted. If this were saved it would make a vast difference in the balance at the end of a year.

We think it must be the new styles in mounts that suggested the question of saving. There is a new pattern of mount every month, and the persuasiveness of the salesman leads to much overstocking. This is one fruitful source of leakage. Instead of buying paper frequently and in small quantities, photog-

raphers should place solid orders. This is not necessarily a mistake especially at this time when war conditions demand economy. If only the photographer spent an evening in figuring out how many sheets of paper are lost in the course of a year by over-printing or under-printing, he would often find that several dollars had gone astray. Several dollars is not much, but with a similar leakage in every department it mounts up. There can be no such thing as one rule for all cases, and this applies strongly to the number of exposures made on a sitter. But many photographers will expose a number of plates and then choose from them the one or two most satisfactory ones. Were the photographer master of his craft he would have seen these one or two most satisfactory ones before he made the exposure. But it is a melancholy fact that in many studios there is still a careless and unnecessary waste of materials which represent hard cash. Cutting down on this can only be parsimony in the case of incompetent workers, for there is little of luck and chance in these practical parts of photography. Plates and paper are made so perfect nowadays that any failure need not be guarded against as arising from defects in them. The failure is in the method of the photographer. There is, of course, the mistake of being too careful in the use of material, but it is a much rarer one than the mistake of wastefulness.

The possession of a negative—i. e.,

of a customer—might be considered as an asset which is often overlooked. There is the waste of plates in getting the satisfactory negative, and then the thing is allowed to drop. It is a strange thing how many photographers there are who take an order for one to a dozen prints and there end the matter. How often a miniature can be printed from the selfsame negative, printed in a different tint, or even colored and enclosed in a gilt frame. Or a print may be fitted in a neat frame-frames are too much neglected by many photographers—to stand on a table or the mantel. Very often, if properly handled, a negative is only half through its usefulness when the prints are run off. Too much value is put on stock negatives, and great numbers must necessarily be kept because a few of them will be useful for repeat orders. But a negative is never worth so much as in the first few weeks of its existence. and this is a main fact which is overlooked; and money which is lost from neglect of this may be fairly considered amon the leakages.

It is on many little things that the success of many a photographer depends, and the sooner he realizes it the sooner will he escape from the condition of

perennial struggle.

STUDY

T is desirable in these times to be able to turn one's hand to many things, so long as they all dovetail one into another, thereby attaining perfection and skill. As drawing is the real foundation of an artist, so far as execution goes, all the rest being dependent on a correct representation of lines, and their effect upon one another, so, too, color derives its effects, the grays causing things to recede into the deep shadows together with the high-lights causing rotundity in all the composition. A due amount of attention to this branch of art will enable the photographer to see lines, and the effect of light and shade, that he would not discern with so quick an eye if he were to pass it by as only an attribute of the painter. This which we have mentioned as the foundation of an artist is but one corner of the structure. The

mind is the real fountainhead, and is the base on which all else must be built, which these others wall up and support. Therefore, it is as essential for the photographer to understand and appreciate these advantages of study in a general way, as it is for the painter who has to produce these effects by hand and eye, often conceiving them in his mind when he contemplates a composition of the

imagination.

For the photographer can also imagine and picture to himself the subject of a composition which he is afterward to select models to represent; so it is well that he inform his mind and eye by constant study of pictures of acknowledged merit, and the rules which have come to be common with all who represent by line and its consequent light and shade, whether it be in black and white or of color. Burnet's Art Essays give the information so much desired and should be in the hands of all, especially those who contemplate art in any of its methods. A thorough study of art will enable one to see pictures in nature that would otherwise escape him, for with this information when he studies he recognizes the rules which the practical eve has adopted as universal. Although nearly every one is impressed with beauty, yet they cannot define it with any accuracy of expression, so that others may see the beauty that has awakened their own admiration. We have a little book that gives many things which would be practical to the photographer in his use of backgrounds and the placing of his subjects in relation to the accessories, which he must make subservient to the prominent idea, or, if it be a portrait, then to that. book is out of print, so we will glean a portion that will directly apply to the theory of effect in photography with the use of backgrounds:

"Whatever form is different to another

is a contrast to it.

"Forms are made by lines, and by light and shade.

"A horizontal line is contrasted most strongly by a perpendicular line.

"A line is contrasted by any other line which is not parallel to it, and which, if continued, would intersect it. "A straight line is contrasted by any irregular or crooked line, as also by any

curved line."

Thoughtful study pays. Read carefully your photographic magazine every month. Keep well informed and let the editor hear your difficulties and problems.

BUSINESS METHODS IN YOUR STUDIO

PHOTOGRAPHY suffers from its dual nature. It is sometimes, in the minds of its practitioners, an art, and the photographer is an artist.

But whether the photographer is an artist or not, he must all the time be a business man. It does not follow that a great artist is a great business man. The reverse is more often the case.

A photographer may make a name for himself under the skylight and still be unable to properly support his family.

In photography the business end must be developed with the artistic, and *vice versa*, and the photographer must enlarge and improve his business methods as he improves his work under the light.

Too few photographers appreciate the importance of the reception-room and the receptionist. The reception-room is going to impress your customer either favorably or unfavorably. Mark the new year by looking over your reception-

room and see if you cannot make it look brighter and more attractive. Your receptionist is not such an easy matter these days, but there are surely ways and means of keying up the desire to make a better business showing. This is a good time to make any changes and to introduce any new ideas.

Look over your sample books and portfolios and have them renewed and put in order. See if you cannot hang up a new and better set of specimens on the walls. If the frames are in need of renewing or renovating, it will be a good investment to renew or renovate.

Go through the workroom and the printing department and see whether you are keeping up with the latest in apparatus and tools. Photography as a science is so recent that what was up to date yesterday is today obsolete. The manufacturers are always showing new apparatus that are, many of them, time and money savers. That there were no automatic printing and drying machines when you started in business is no argument against you putting one in now. Don't be afraid of taking up a new idea. An inventor, seeking to enrich himself, can only do so by inventing something of real merit.

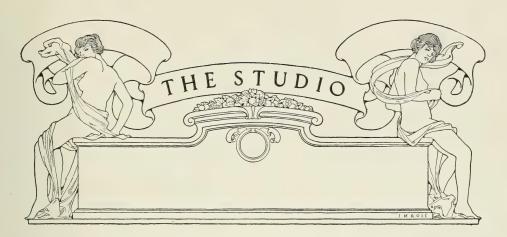
While always striving to make better pictures, don't for a moment relax on the selling end. It is the vital part of

your business.

NEW TIMES

New times demand new measures and new men:
The world advances, and in time outgrows
The laws that in our father's day were best;
And, doubtless, after us, some purer scheme
Will be shaped out by wiser men than we,
Made wiser by the steady growth of truth.

JAMES RUSSELL LOWELL



PRACTICAL PAPERS ON STUDIO WORK AND METHODS

The Science of Salesmanship

Sow a thought, and you reap an act, Sow an act, and you reap a habit, Sow a habit, and you reap a character, Sow a character, and you reap a destiny. Today I desire to sow the thought of salesman-

Do you sell photographs because you know the science of selling, or do you sell them when a patron requests you to make a picture? By the science of selling, I mean, have you so studied and analyzed your selling method that you can lay down definite rules and principles? If so. then your knowledge has become a science.

Years ago, were you a successful salesman of photographs, it was thought you were lucky, or born a receptionist. In fact, in some studios, this thought has not entirely disappeared even today. There is no question but that some of us are born with a greater natural aptitude for salesmanship than others, but a natural aptitude for salesmanship, undeveloped and untrained, is of as little value as an exposed plate undeveloped. must be a keen observer, have a knowledge of human nature, and use that knowledge to the best advantage and obtain an order.

Today we realize all salesmanship is upon knowledge; knowledge of yourself, knowledge of human nature, knowledge of the photographs you sell, and the knowledge of interesting a

customer and closing a sale.

Success in photography depends largely upon four things: Your buying, your cost of produc-tion, your personality, and your efficient selling. Carelessness or bad judgment in any one of these will eliminate profit and cause failure. I ask you to gaurd most carefully the last two: your personality and efficient selling. Photographs seldom sell themselves, and competition is daily growing keener, and with this increasing keenness comes the intense struggle, first to obtain customers, and then to keep them. You may be able to make the most beautiful and artistic

photographs imaginable, but, if you cannot sell them, what does your art avail you? How many of you know the definition of salesmanship? The answer is persuasion, and consists of the elements:

First, yourself. Second, your proposition.

Third, the other person's mind.

Let us take these elements and consider them. Yourself.—In yourself, the power of persuasion depends upon the development of the powers of your body—intellect, feeling and will. The more powerfully your mind works, the greater is your power to influence the minds of others.

Your Proposition.—In order to know your proposition you must study and analyze it, and be able to tell your prospective patrons about it. Since people must believe what you say to them, in order to be convinced and persuaded, you must cultivate not only your inherent honesty and truthfulness, but the frankness, candor and naturalness that impresses those who see and hear you with reliability

The Other Person's Mind.—You must be able to see your proposition with his eyes, think about it with his mind, and talk about it with his sat-

isfaction and advantages in mind.

Efficient salesmanship is based upon fundamental principles which are general, and underlie the successful selling of all photographs.

Let us analyze these. First, introduction.

Second, attention must be attracted to photo-

graphs.

Third, interest must be aroused in photographs.

Fourth, interest must be intensified to desire

to have photographs.

Fifth, desire must be changed to decision to

have photographs.

First, the Introduction.—The approach of the patron to the receptionist. At this time the receptionist should size up the patron as to character and temperament, which are usually por-

trayed in the face and carriage, and make a decision as to which method will be most effective in securing an order. Scientists tell us there are three distinct types of character. These we must know.

1. The Motive Type. Persons with oblong faces, high cheek bones, large bones and bodies showing a tendency to angularity. The neck is long and set upon broad shoulders, while the chest is moderate in size and fullness. The figure is usually tall and striking, but not always elegant. This type possesses a great capacity for perception, and is generally firm, self-reliant, persevering, and sometimes domineering. This is frequently referred to as the American type. They do not like to be troubled with details, neither do they like to be kept waiting.

2. The Vital Type. Persons with round faces,

2. The Vital Type. Persons with round faces, rather strong, but not so much as the motive type. They have a florid complexion, and a cheerful countenance, while the body shows an inclination to stoutness. This type is enthusiastic, impulsive and very cheerful, but frequently changeable and fickle, and can easily be led. They will change from one concern to another, for no other

reason except love of change.

3. The Mental Type. The nervous and brainy type. Head is large in comparison to body. Face is oval, with high, broad forehead, and the neck is slender. The eyes are bright, and expressive. The features are fine and delicately chiselled, and the whole figure slender and graceful. They think deeply and quickly, have excellent tastes, and a love of the beautiful, also great imagination. They represent what is called the artistic type. The nervous system is highly developed, and the result a tendency to nervousness, irritability and fickleness. Here the receptionist must know her work thoroughly, and express its selling points forcibly, for this type asks questions which, if not answered intelli-

gently, quickly lose an order. A receptionist must act in a positive and definite manner to assure confidence. Confidence begets confidence, and if you would have others place confidence in what you say and do, you must show confidence in them. The average person likes to have his portraits made by his friends; in other words, he likes to patronize the people he likes personally. Therefore, if you would be a successful receptionist, you must cultivate the art of being friendly. Not the veneer variety, but the kind that springs from genuine love of humanity. Let it show itself quietly, not with gushing exuberance, but warmly and genuinely. The first impression the receptionist makes upon the patron is a lasting one, consequently it must be favorable and pleasing. We all know the healthy body attracts more favorable attention than the unhealthy one, and the receptionist who is cleanly, neatly and tastefully dressed, and carries herself well, conveys a more favorable impression than the careless, slovenly, slouchy one. In order to prepare yourself for a successful receptionist, you must cultivate the habit of decision and determination of will. Remember, he who hesitates is lost. You must not only be decisive and determined, but also persistent.

The Hair in Portraiture

Much of the portraiture that one sees is spoilt by reason of the fact that operators give far too little attention to a proper rendering of the sitter's hair. Either we see it blurred, almost to wooliness, and far from natural, or else it has the texture of fine wire; and in this latter case the eye of the beholder is irritated by the intense sharpness. The aim of the operator when focussing for the hair is to give a suggestion of luster and texture. With many feminine sitters much that is delightful may be traced to beautiful hair, and upon a satisfactory rendering of this much of the success of the picture depends. To get the best results color will have to be taken into consideration, and an ortho plate of the antiscreen type used, or the exposure made upon a panchromatic plate without a screen, in preference to the portrait or studio plate; in either case a more satisfactory rendering of the color of the hair will be obtained. It is not always admissible to make any suggestions with regard to dressing the hair, but a hint may be given to the sitter as to the advisability of keeping to the everyday style in preference to anything fresh, as is so often done whan a picture is to be taken. In the latter case much of the natural wave and luster of the hair will certainly be lost. Hair ornaments or ribbons of any kind are best avoided, as they only tend to create a distracting note.

Lighting will be found to play an important part, and if this point is given attention the black textureless patches so often seen in portraits will not appear. A very slight diffusion, avoiding the needle point definition, which gives the unpleasant "wirey" effect referred to above, is a great help, but it must not be carried too far, or the suggestion of the natural wave and texture will be lost. In this the soft-focus lens is of great

assistance.

Perhaps the most difficult hair to render in a satisfactory manner is that which is long, dark, and without much luster. In this case it is best to use as strong a lighting as possible, in order to give what texture there is a chance to be seen at its best, and then by diffusion to counteract

the difficulty.

When dealing with male sitters, the hair is generally of less account, unless it forms quite a characteristic of the sitter, and so presents less difficulty in this respect. Perhaps bearded men are among the greatest problems the operator has to encounter, as anything of a "wirey" or "ropey" nature is most unpleasant, and will neither satisfy portrayer nor the portrayed. With bearded men the beard is an individual feature, and must be recorded successfully. And here again the diffusion given by the soft-focus lens will prove helpful. The point to be noted is that all the sitters who are photographed have some distinctive characteristic in hair or beard (if one is worn), and no result can be regarded as pleasing unless a faithful rendering of this is presented, and the points set forth above are worthy of the study of all operators, being some of the small things by which the success of photography is made up.—British Journal of Photography.

As Others See Us

One of the disadvantages of building up a business is that we are very apt to overlook faults that are most palpable to an outside observer. The photographer, like any other business man, may have his own ideas of what is good enough for himself and quite miss the points which would render the premises attractive to the public. If he is a good photographer, he is apt to consider the quality of his work to the practical exclusion of all else, and there is always a danger of a general dinginess settling down upon the whole establishment without its being noticed. This is fatal nowadays. The public does not expect to find a combination of a dentist's waiting room and a workshop, but a bright, tastefully arranged suite of rooms, which help to raise the spirits of the visitor rather than to depress them. After all, in some quarters there are grounds for the old jape about a visit to the photographer's being as bad as a visit to the dentist's, and this not because of the actual manipulation in the studio, but on account of the appearance of the place and the procedure adopted. It has been said that competition is the soul of business, but it is no less true that emulation is the mother of efficiency, and it would not be altogether a bad thing if photographers could get on visiting terms with each other and thus develop a little of the house-pride which is inherent in every woman who has a home of her own.—British Journal of Photography.

Background Service

THE old system of fixing the backgrounds on stand-rollers and other similar contrivances should be abolished. My chief reason for this decision is that nearly all backgrounds, which may be included in the categories of interiors, exteriors, scenic, and the many types of the conservatory description, can be dispensed with. The above remarks should carry conviction when one ponders on the large number of clients who demand either the plain white background or, in many cases, a portrait study showing a dark background. Curiously enough this gentle demand is in evidence in middle or lower class studios, as well as in the studios which only the "upper ten" patronize. Taking this fact into consideration, I wish to point out that in many studios not only could a certain amount of useful space be saved, but also that a judicious arrangement of backgrounds makes for speed in working the latter—and, what is of equal importance, the comfort of the worker. The method in practice not so long ago should be altered to suit up-todate requirements. I will now endeavor to explain how a minimum of expenditure and trouble will secure a maximum of variety in the use of backgrounds, as well as the greatest rapidity in their manipulation. The length of the studio is of little consequence here, save that in short or cramped studios the saving of space effected will be all the more appreciated.

A Background for Sketch Work

Taking an average of about 13 ft. in breadth, I propose first to deal with the sketch back-

ground. This decidedly requires careful consideration owing to the immense popularity of sketch portraiture. For subjects representing moderate-sized groups an 8-ft. ground would be ample, but nowadays orders frequently come in for large groups, and it would be as well to be prepared for such. This, of course, calls for a continuation of the ground at both sides. Should one be fortunate in possessing a canvas or old ground of the required breadth, it can easily be converted into a most useful background for all sketch work.



Fig 1.

It should be stretched on to the back frame of the studio, or attached to the back wall by means of strips of wood running down the wall, about 2 ft. apart. A great advantage will be gained by having just about 10 ft. of the canvas flush against the wall or support. The 1½ ft. of canvas at both ends should be brought forward a little in "wing" fashion, as in Fig. 1. All operators are aware that the corners of the studio are not so well lit as the central part of the ground. Therefore the advantage referred to will at once be recognized. Assuming that an 8-ft. canvas is the only one available for sketch work, then another old ground ought to be cut in two halves and attached by stitching a part at both ends of the background. In either case when fixed into position as above noted, the background must first get a thorough sponging to remove the dist. Should it be very dirty it will be advisable first to sponge it with a weak solution of carbonate of soda. A final rub down with a rubber sponge saturated in warm, clean water will be necessary. The canvas is now permitted to dry, and it is then painted over with one or two coats of Hall's sanitary distemper.

In many studios the operator is seriously handicapped in sketch work by being forced to take large groups against an 8-ft. background. As a direct result of this the figures have to be placed too closely together. This difficulty is more evident when the group is to be taken full length. The operator is still more at a disadvantage when he is expected to use a halfplate where the order is for 8 x 6 or larger. The forced study of economy in plates, in view of the highly increased cost, will make the use of too narrow a background a matter of extreme inconvenience. In these circumstances the side figures will often be on the extreme edge of the plate, and vignetting or "sketching" will prove to be a source of worry and difficulty to the printing and finishing staff. When a large group has to be taken the operator is forced to improvise some substitute for continuing the background, which is not often satisfactory. It will be patent, then,

that by using a background of full width, not only will much time be saved, but also a considerable amount of vexatious trouble and annoyance.

The Dark Background

It will be noted that, so far as the sketch ground is concerned, practically little space has been taken up, and I may suggest that it may be advisable in some cases to alter the lighting arrangements to suit the altered system. We have now to reckon with the dark ground. This is also a most useful accessory and is used for a variety of purposes. A few pounds spent on this will amply repay the initial outlay. It is always false economy to provide a cheap substitute for an accessory that is expected to be much in use. This background or "curtain," to be exact, should be fixed about 10 inches in front of the white ground. The best and quickest method is to hang it on a rod, so that it may be "whisked" away to the side wall. In reality, for convenience of working, two half-curtains will be needed. Twenty-two yards of black velveteen will be received. This restriction has been applied to the state of the same and the same are the same and the same are th required. This material should be 30 inches wide, and will be found to be very serviceable. The cloth should be cut into eight equal lengths and handed to a machinist to stitch together. Whoever is entrusted with this work should be advised to make two curtains—that is, four pieces to each, so that they will form two curtains 10 ft. by 8 ft. A caution should be added that the "pile" must always run upward. This precaution will prevent excessive reflection of light upon the folds. If carefully ironed at the back, the seams will not be visible. One-inch brass curtain rings should now be sewn on the top about every 15 inches, so that the curtains may run or slide freely on the rod. A $\frac{5}{8}$ -in. brass rod. about half an inch less than the width of the back of the studio, should be procured and placed into its position at the top, so that it will provide a sliding bar for the free movement of the curtains. This rod should be supported at both ends by a block of wood fixed to the side walls. Two pieces of wood about 2 inches thick will be required. The length does not matter, about 6 inches being ample. A "V" should be cut out of the top of each, and they will be ready for fixing on to the side walls, as in Fig. 2. By adopting this method the curtains can be put up or taken down without any loss of time, although this will not be required except occasionally for cleaning purposes. A half-curtain is kept at both sides, and when a full group has to be posed both curtains are brought into use, when a fold will hide the join at the center. As there will be plenty of fulness, a tug here and there at several parts will cause a series of folds that will provide a very pleasing background, suitable for many artistic studies. For a bust, three-quarter length, or even a small group, one of the curtains pulled into the middle would suffice, as it gives a ground of 10 feet without the folds.

Rembrandt Effects

It will be obvious, of course, to the portraitist that the position of the curtain background will not be suitable for Rembrandt effects. This popular style of portrait necessitates the use of a background fixed on to a stand that runs with castors. As a general rule this is at best a clumsy and unsightly object in a studio, and as it takes up considerable space, always seems to be in the way. In penning these lines my primary object is to save as much space as possible, and the problem is further overcome by dispensing with the use of the stand-supported background, and substituting one on the roller principle. This is accomplished by adopting the following plan: First, place the existing stand into its usual position when in use for Rembrandt heads. A sitter is now carefully focussed, and the supported background moved about until a pleasing

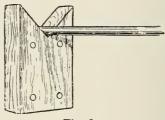


Fig. 2.

and satisfactory result in lighting is observed on the focussing screen. The position is marked on the roof or floor exactly equivalent to the top or bottom of the stand. The latter is now removed, and any tradesman will fix up at very little cost a pair of arms to support both ends of the roller. A piece of dark cloth is fixed on this roller by the same method as ordinary backgrounds, and it will work up or down by means of the cords in the same way.

A Plea for Firelight Studies

I would strongly urge those who have not already done so to introduce that style of portraiture known as the firelight study. Instruct a tradesman to make a simple fireplace with mantelshelf complete. This should be made of light material, so that it may easily be lifted to the side when not in use. It certainly should not be made of large proportions, but if too heavy for the assistant to lift, four castors will remove that little difficulty. A carpet footstool and a skin or ordinary rug complete all the accessories required. Many beautiful studies can be secured by using the above. When a firelight negative is retouched a splash of any opaque water-color on the glass side above the grate bars lends the realistic effect of flames leaping up the chimney flue. The black curtain makes an admirable background for these studies. The prints should, of course, be stained with the "Vanguard" firelight stain or orange dye. A very pleasing effect is also obtained by first toning sepia and then re-toning with the salt-sulphocyanide-gold chloride process, which gives that fine red-chalk tint. This latter process does not stain the whites, but, to my mind, I do not think this a serious disadvantage. A family group should be neatly arranged in cosy, homelike fashion. None of the group should be looking

toward the camera. In fact, no operator will find any difficulty in posing a group for a specimen picture. A fairly full exposure, lit from one side only, gives the most satisfactory results. A glance at Fig. 3 will show approximately an arrangement for experiment. A carefully finished enlargement, say about 15 x 12, will prove to be one of the best business "pullers" in the window or showcase.

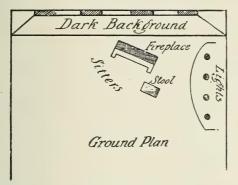


Fig. 3.

We have now secured a series of backgrounds with which we are enabled to cope satisfactorily with large groups in sketch or other styles without fuss or bother. Add to this the fact that we have only used up about 12 inches of space, and the great advantage gained will at once be realized. As there will be ample space left in front of the velveteen curtains a few other backgrounds of the scenic variety can be fixed up for emergency use on the ordinary roller principle. A plain light linoleum makes a most serviceable and lasting foreground for sketch and most other work. Finally, a length of dark felt about 8 ft. by 5 should be provided. This makes a capital foreground for full lengths and groups to be taken against the dark curtains. This felt is kept rolled up at the side wall when not in use.—Morris Levy in British Journal of Photography.

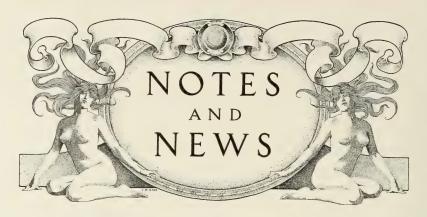
Customer's Original

ONE of the minor worries of many photographers is the responsibility for the safety of original photographs, drawings, or miniatures entrusted to them for copying. Unless there is some system for keeping them safely, this particular class of article has a wonderful knack of getting mislaid, soiled, or injured, with the result that even if no claim for damage arises there is considerable unpleasantness and a loss of reputation for the photographer. The only safe way

is to regard each "original" as a valuable piece of jewelry, to be locked up as soon as it is received, only to be given out when the actual copying is being done, and then to be promptly returned to safe keeping. We have in mind a case where an old glass positive was brought in for enlargement. It was left unprotected upon a table, became covered with a letter and had a heavy paper weight dropped upon it, with the result that it was reduced to splinters. The situation was saved by cementing the pieces together, copying and enlarging in accordance with the original order, and having a wet collodion copy of the enlargement made to replace the original in the frame. The cost of this extra work more than swallowed up the profit on the entire job, yet all this might have been averted by a moment's care in putting the positive in a place of safety. Copying is usually regarded as a bore by operators, and originals often lie about in the studio for weeks before an opportunity is made to deal with them, with the result that their appearance is not improved when they are returned, and, worse still, sometimes they disappear altogether. It is a simple matter to place each in a separate plate box, and to stick a gummed label on the lid giving full particulars of the order. If treated in this way it is next to impossible for them to be overlooked or injured. Another thing which is often omitted is the re-sealing of daguerreotypes or miniatures which have to be taken out of their cases or rims for copying. This was formerly done with gold-beater's skin, which can be obtained from most chemists, but, if unobtainable, the thin gummed paper used for mending music answers nearly as well. It is not fair to the owner to return his picture in a less protected state than that in which he brought it.—British Journal of Photography.

Think

THE strain upon the photographers at the present time and their inability to secure proper and efficient help and the demand made upon them for pictures to be finished in a short time, keeps them down to the ordinary routine and details of their business. But no photographer should be too busy to set aside a little time each week just for thinking, sort of reviewing, looking over his stock, checking up his business, learning where he can improve his service so as to turn out the work more promptly than he has been in the past, making necessary repairs and ordering equipment that will help him to be more efficient. Do not think you are wasting your time when you take an hour or two off to investigate your own plans. You will make more money doing this than you will in any other way.-Ohio Photo News.



Important to Every Photographer

You are no doubt aware of the fact that the war has brought about an embarrassing shortage in optical glass for our photographic lenses, due to our former dependence upon other countries. You are in a position to render vital assistance, so we have come to you for help.

so we have come to you for help.

If you have a VIIa Protar lens, size No. 13 or
17, this lens is urgently needed for photographic

work on the other side.

There is no more Protar glass and the manufacturers cannot produce even one more lens in this particular size, but if you will turn in your lens you will perform a service which can hardly be measured in terms of its value. We must have lenses *immediately*.

We do not wish to be forced to commandeer these lenses, as they did in Europe, but the army must have the lenses as one of their many necessary tools. Bear in mind, that this is your war and that lenses are one of the many instruments we are using to blast the way to Berlin.

You will receive full retail value for your lens, assuming it is in good condition, aside from the thanks of the boys who are overseas. Let us have an immediate response and if you know of anyone else who has a Protar in the numbers from 11 to 19 inclusive, please pass the message along to him.

Let us know at once if we can count on you. Address Signal Corps, Granite Building, Rochester, N. Y.

Greatest Photographic Necessity Controlled by Government. You Must Save Silver Waste

THE Government has found it necessary to so control the use of gold, silver and other precious metals that their waste or use in non-essentials will be limited and the supply conserved for such purposes as will help in winning the war.

This applies directly to every photographer, for silver is essential in your business. All of you use silver every time you use a film, a plate or a piece of paper. And every time you throw away of scrap of paper or pour a fixing bath into the sink you are wasting.

Photography is an essential business, but the silver that has been going down the waste pipes must be conserved—must find its way back into the channels of commerce.

Every photographer who is not already recovering silver waste should begin at once, for both patriotic reasons and the preservation of his own business.

You have helped to conserve food, have voluntarily made sacrifices that have more or less inconvenienced you, and you should be all the more willing to conserve this great photographic

necessity.

If the supply of silver should be cut off you would soon be put out of business, for you must have sensitized materials. And since fully one-half of the silver in a plate or film or piece of paper goes into the fixing bath from which it can readily be recovered, your saving of this silver will help to prevent a further shortage and the serious curtailment of necessary photographic supplies.

Silver waste is worth almost three times what it was a few years ago, and its recovery is simple and inexpensive. If you have not found it profitable in the past, consider present conditions. Silver is worth a dollar or more an ounce. It requires about three ounces of the commercial form of sulphide of soda to precipitate an ounce of silver, sulphide of soda answering equally as well as the more expensive sulphide of potash for this purpose.

There are large photographic establishments that recover all the way from \$500 to \$1000 a year from fixing baths, scrap paper and spoiled prints. You can recover in proportion and should be more than willing to do so because it is necessary as well as profitable conservation.

Pour all of your discarded hypo solutions into barrels. When a barrel is full, add about one quart of a freshly prepared, saturated solution of sulphide of soda. Stir well and allow to stand for at least twenty-four hours. At the end of this time dip out a graduate full of the solution and add a small quantity of the sulphide solution. If the solution remains clear all the silver has been precipitated. If a sediment forms, add more sulphide to the solution in the barrel.

It is important that barrels in which silver is being precipitated should be kept as far away from your work rooms as possible. The fumes from sodium sulphide are ruinous to sensitive photographic materials. Covering the barrels will help do away with the objectionable odor of the

sulphide.

After all the silver has precipitated, pour off the clear solution, scrape out the sludge remaining in the bottom and place it in a sack, hanging this over the edge of the barrel until it has thoroughly drained. It should be as dry as possible before it is sent to the refiner.

To recover silver from paper waste it should be burned where there are no draughts, as the

ashes contain the silver.

Wet slude, which has been thoroughly drained, amounting to twenty-five pounds or more, can be profitably handled by the refiners, or if thoroughly dried by heat, half this weight. It is best, however, to ship as large a quantity as possible at one time.

Some photographers find it is not practical to recover silver in the studio or directly on their premises because other tenants object to the odor of sulphide. In such cases it is worth while to accumulate a barrel or two of old fixing solution and take it away from the studio for the precipitating process. If barrels are not convenient to handle, five gallon cans that have contained oil are cheap and easily handled and may be had from most any garage.

You must be short of help, you may be busy and feel that it isn't worth while to save fixing solution, even if it is worth eight or ten dollars a barrel, but—you are doing a lot of things you don't like to do and are doing them cheerfully because they have been made necessary by war. Silver must be saved—you can save it—you will save it because it is a war measure and may also affect the life of your business.

The following refineries will be glad to advise you on request as to the minimum quantities of waste they can profitably handle:
Handy & Harman, Bridgeport, Conn., 31
Gold St., N. Y.

Gold St., N. Y.
T. B. Hagstoz & Son, Philadelphia, Pa. Elizabethtown Smelting & Refining Co., Newark, N. J.

Emil Schneider, Newark, N. Philips & Jacobs, Philadelphia, Pa.

Irvington Smelting & Refining Co., Irvington,

N. J. Thomas J. Dee & Co., Chicago, Ill. Spyco Smelting & Refining Co., Minneapolis, Minn.

Wildberg Bros., San Francisco, Calif.—Studio Light.

Be Wise in Time

Wisdom is of no value to any one unless it is used at the right time. We may know certain facts which if used at the right moment will be of great aid to us, but wisdom is of no value to us or anyone else unless we use it at every opportunity. Oftentines we find that by putting off, when we know we should do a certain thing immediately, we lose out. We have the wisdom but we do not use it at the right time.

If you will make a study of the photographic business and the materials used and very carefully watch the markets on paper, chemicals, materials, etc., you can easily see that there is going to be a gradual increase (possibly slight) on all phototraphic materials. It cannot be otherwise. It is becoming harder and harder to get material as well as men to manufacture the There is an increase in transportation charges and a large increase caused by delays. Any one of us who has watched the situation carefully during the last two years is wise enough to know that prices will be higher six months from now than they are at the present time and that makes no difference whether the war closes by that time or not.

By being wise in time there is opportunity for us not only to make a few dollars in the cost of supplies, but we will have the goods when needed, which will mean an additional profit also. It is true that manufacturers and dealers are going to do all they possibly can, not only now but at all times in the future, to supply the photographers' needs, but now it is impossible

to guarantee anything.

The photographic business was never in as good condition as it is right now. Your business is good now and it is going to be better. Provide for what is coming by being wise in time.—Ohio Photo News.

"Battle Photography"

THE October Scribner's Magazine contains an interesting article on "Battle Photography" illustrated from French and Belgian official photographs by William Beebe, who has been in France flying as an observer. These unusual pictures must be of special value to all interested in aërial photography.

Eastman Kodak Co. Research Laboratory to to make Rare Chemicals

When the allied planes attack Mannheim, the point at which they aim to drop their bombs is the great Badische dye works just outside the This is the largest dye works in Germany and has been converted very largely from its original purpose to the manufacture of high explosives and poison gases. It was because the manufacturers of dyes had available a large force of research chemists that Germany was able to produce so quickly the explosives and the poison gases for the war. This was an important part of Germany's plan of preparedness.

The mobilization of the largest force of chemists in the world at Washington for work on poison gases shows how vital research in organic chemistry is at the present time. One of the great advantages of German research chemists before the war was the possession of a ready source of the chemicals from which their work could be started, the production of these rare chemical reagents being a monopoly in the hands of a few German firms. With the cutting off of the German supply it became necessary for American research chemists to make their own chemicals for research work. This occasioned delays in important work-delays which could only be lessened to a small extent by the efforts of our universities, a few of which came forward and made some of the chemicals that were required.

In order to make sure that the chemists of this country may for all time be independent of German chemists and their products, and may have an adequate supply of the chemicals necessary for such research work as this war has shown to be an important preparedness measure, the Eastman Kodak Company has arranged to establish a department of its Research Laboratory to make these rare chemicals. The work will be done exclusively by women chemists as assistants, the nature of the work being such that it is considered suitable for them. It presents an opportunity for women to take an active part in chemical work of national importance. The new laboratory will be under the charge of Dr. H. T. Clarke, and it is expected that before long German monopoly in the production of the reagents necessary for chemical research work will be a thing of the past.—Studio Light.

Chicago Camera Club

At the last meeting an enlightening and entertaining talk and demonstration on studio portraiture was given us by a professional, Edward D. Waters. He dwelt on the psychological handling of his subjects convincingly, claiming that to him, it was 90 per cent. in the producing of successful portraits. His work shows the subjects at their best, relaxed and natural.

One evening was given to the discussion of Bromoil work. Considerable interest was shown, resulting in quite a few members taking up this

flexible and artistic printing process.

New officers have been elected for a year's term, as follows: President, G. C. Abbott; Vice-President, W. F. Wienecke; Secretary, W. H. Klose; Treasurer, O. W. Bahl. New committees have been appointed and, from several advance reports, activities, instruction, and entertainment on a larger scale will be forthcoming.—A. E. Anderson, Chairman Publicity Committee.

Philadelphia Photographers Organize

THE Philadelphia Chapter of the Photographers' Association has been formed and the next meeting will be held at 1507 Walnut Street.

The following officers were named: President, Ryland W. Phillips, of 1507 Walnut Street; vicepresident, Richard T. Dooner, of 1629 Chestnut Street; treasurer, William Shewell Ellis, of 1612 Chestnut Street, and secretary, Josephine L. Smith, of 1507 Walnut Street. James L. Dillon and Hans Stolze were elected as members of the Executive Committee, while John Ivanzian, of 5909 Market Street, was appointed chairman of the Publicity Committee.

All persons connected with the photographic profession, whether employers or employees, are eligible to membership and will be taken into the

ranks of the association.

New Studio Flash Lamp

This lamp, made by the Halldorsen Co., is designed for general studio lighting where a modern, dependable lighting system is necessary. The special features are the ease with which it can be rolled about the studio, the balanced up-and-down movement, the repeating electric ignition system, the light control by means of prooflight and double head screen, and its attractive and rigid style of construction.

The base of the lamp consists of a hardwood frame, upon which are erected nickeled-steel tube standards. Slidably mounted upon these standards is the body of the lamp; the back, sides, and top of which are three-ply and special compressed board. The front, or sky cloth, is of flame-proof fabric and is conveniently removable for renewal and cleaning. The body is balanced in its up-and-down movement by weights within the tubes and may be set at any height by shifting a lever. The lamp is mounted upon large, rubber-tired casters and may be rolled about and adjusted in position to sitter with minimum effort so that even a woman can operate it with ease.

The jump-spark system of ignition is secured direct from regular alternating current. Where there is no current or only direct current the dry-

cell jump spark system is supplied.

The repeating feature is a lever-operated disk upon which six powder containers are placed, and which are operated into position successively after loading. This system permits the use of fresh, tested flash powder, and all six containers are loaded before beginning the sitting, so that no further attention need be paid to loading during the sitting. Any number of the six may be loaded or single loading may be used with the same convenience. A safe lever and locking device is employed, so that ignition is impossible except when off safe, and all loading is done from the outside without being exposed to either smoke or flame.

The outfit is wired to receive prooflights, which give a reliable advance proof of how the light will appear on the sitter in the flash, and the double head screen serves to assist the operator in balancing the light. A smoke exhaust chimney for allowing smoke to pass into flue is attached

to top of body.

This is one of the latest and best lamps on the market and the Halldorsen is fast becoming a high standard for practical service. Further particulars upon application.

Dayton Photographers Organize

The photographers of Dayton met at the Greater Dayton Association rooms, September 9, for the formation of a Dayton chapter of the Photographers' Association of America.

In accordance with the Association's general policy, their aim is the furtherance of art. They have pledged themselves to aid the Government

in any way they are called upon.

A board of directors, consisting of seven members, was chosen. These are: J. Zweifel, president; Don Wallace, vice-president; J. T. Liddy, secretary; A. Grossman, treasurer; Louis A. Mahler, H. T. Tweedie, and Frank Hermes.

Regular meetings of the organization will be held the second Monday in each month.

Photographs no Longer a Luxury

Sometime ago the French placed a tax on luxuries. From information received the Parisian storekeepers are having a great deal of trouble in collecting this tax from their customers. England has been working on a so-called "luxury

tax" for some time. The committee in charge of investigating the articles which shall be taxed under this law, after thoroughly investigating the same, have come to the following conclusion: That photography in normal times may have been a luxury but today its existence is chiefly due to some connection with the fighting forces and that the amount of comfort and good cheer derived by the men at the front upon receipt of photographic records of home life is unestimable In other words, photography is now classed among the essentials and not the luxuries of life.

The English officers in charge of the men at the front are urging those at home, not only to send letters, but photographs as often as possible.

The photographers, dealers, and manufacturers have all appeared before the committee, showing that almost, if not all, of the present photographic business of England pertains to the war or the men at the front.

There is some talk of a luxury tax in America. When this comes up for discussion it will be well for us to remember the position taken by the governments across the water, and that today photography is an essential and not a luxury, as in the past.—Ohio Photo News.

Federal Trade Commission Issues First Order in Motion-Picture Field

The Federal Trade Commission, after exhaustive inquiry, has ruled in the motion-picture case, issuing a formal order requiring the Stanley Booking Corporation, of Philadeophia, to discontinue the following business practices, held to be "unfair methods of competition." The corporation is a film-booking concern, and the case the first of its kind. The order prohibits the following practices:

"(a) Procuring the cancellation of contracts for the exhibition of moving-picture films made and entered into by and between its competitors and the producers of moving-picture films.

"(b) Procuring moving-picture films which have been announced and advertised for exhibition and display by its competitors and exhibiting and displaying the same in advance of the dates so advertised and announced by such competitors at theaters in the neighborhood of those of competitors, where the procuring of moving-picture films and exhibition of same is done to hinder harass and embarrass competitors.

hinder, harass and embarrass competitors. "(c) Making and entering into contracts for the leasing and sale of moving-picture films on the condition, agreement, or understanding that the lessee or purchaser thereof shall not exhibit, use, or deal in moving-picture films produced, handled, or dealt in by a competitor or competitors of respondent.

"(d) Making threats and employing methods of intimidation to induce and compel owners and operators of moving-picture theaters to pay it, the respondent, a sum equal to 10 per cent. of the cost of miving-picture films booked directly

from the producer of said films or the film ex-

changes, or to pay to it, the respondent, any sums whatsoever on moving-picture films booked directly from the producer of said films or from the film exchanges.

"(e) Making threats against independent exhibitors of moving-picture films that, unless such exhibitors booked through this respondent, their supply of moving-picture films will be cut off.

films and film exchanges with the withdrawal of this respondent's patronage in order to induce the said producers and film exchanges to cease supplying certain of their competitors with moving-picture films."

Preliminary Announcement from the Pittsburg Salon

THE sixth annual Pittsburg Salon of Photography will be held in the Carnegie Institute, Department of Fine Arts, during the month of March, 1919.

For further announcements see the next issue of the photographic journals. The conditions of entry and entry blanks will be forwarded later, on request from any one interested, on application to Charles K. Archer, Secretary, 1412 Carnegie Building, Pittsburg, Pa. The last day of entry will be about February 10.

last day of entry will be about February 10.

Our slogan—"Photography is helping to win the War"

Commissions for Instructors at Rochester School

Commissions have been awarded fourteen instructors at the United States School of Aërial Photography at Kodak Park. The men commissioned are:

Isaac C. Cornig, Lawrence B. Cundiff, Kelsey E. Gardner, Arthur C. Hardy, Winthrop P. Haynes, Lewis G. Lederer, William B. Poynter, Howard N. Tandy and Hutin J. Jacobi. The commission of Joseph C. Beaven dates from August 17, and that of Hutin J. Jacobi from August 19.

Four of the men commissioned had been transferred to Madison Barracks. They are Roy Evans, Arthur C. Hardy, Normal E. Hinds and Parke H. Struthers, whose commissions date from August 12.

Wanted: Pictures of German and Austrian Territory

Readers who have made pictures of bridges, buildings, towns and localities now occupied by the German forces in France, Belgium, and Luxemburg, also in that part of Germany west of the line running north and south through Hamburg, should send such photographs by parcel post or express to Col. A. B. Coxe, 1156 Fifteenth Street, Washington, D. C. Pictures of the Rhine and of towns situated along its course, and views in Austria, are also of value. These are requested by the War Department.



The WORKROOM

ONTAINING THE LATEST PROCESSES, FORMULAE AND APPLIANCES NEEDFUL IN THE ART OF PHOTOGRAPHY FOR THE OPERATOR & WORKER

MAKING ADVERTISING SLIDES CHEMICAL FOG DISHES AND SOAP MAKING CARTOON CINEMATOGRAPH FILMS RETOUCHING HINTS THE "RESTORATION" OF DAGUERREOTYPES NEGATIVE DRYING THE PORTRAIT LENS AND ITS ADJUSTMENT COMBINATION PHOTOGRAPHS A WAX MEDIUM AND PROCESS FOR THE PERMANENT COLOR-ING OF PHOTOGRAPHS THE EFFECT OF THE IRON CONTENT OF AMMONIUM PERSUL-PHATE ON ITS PHOTOGRAPHIC POWER TESTING A LIGHT FILTER ON THE UNMOUNTING AND RE-MOUNTING OF PHOTOGRAPHS KNIFE WORK ON BROMIDES SOME ESSENTIALS IN THE FITTING OF THE DARK ROOM THE TECHNIC OF PRINTING-OUT PAPERS THE INFLUENCE OF GOOD NEGATIVES TONING BY RE-DEVELOPMENT

FAILURES IN SULPHIDE TONING



THE WORKROOM

By the Head Operator



Making Advertising Slides

It is often required to reproduce reading matter and a photograph on the same slide, as in slide announcements for motion-picture theaters. It is unsatisfactory to copy direct without any modification, the result being either weak lettering with good reproduction of the photograph, or strong lettering and a contrasty photograph with clogged-up shadows.

In order to obtain accurate tone rendering in the photograph, and at the same time get good contrast in the line portions, it has been found at the Research Laboratory of the Eastman Kodak Company that either of the following methods

will give satisfactory results:

1. Assuming that the photograph and reading matter are arranged on the same card, when copying, use an emulsion similar to that of the Seed 23 plate or Eastman commercial film, and adjust the exposure and developer so as to obtain good tone reproduction of the photograph, ignoring for the time being the line work. When dry, block out the photograph portion of the negative with lantern slide or negative var-nish, and, when dry, "cut" or slightly reduce with a mixture of potassium ferricyanide and hypo, wash thoroughly, and the intensify.

If the slide is now printed on an emulsion such as the Seed Lantern plate, the shadow detail in the photograph will be retained providing the negative in the first place was given a full

exposure.

Instead of proceeding as above, the photograph and reading matter may be copied separately, using a process plate for the line work and Eastman commercial film for the photograph, adjusting the size of the latter so that it just fits into the space allotted to it on the glass negative. After making a positive from the negative of the reading matter, so as to obtain white lettering on a black ground, affix the film to the negative and use this as the master negative in the usual way.

Film may be affixed to glass by means of a solution of gelatin dissolved in glacial acetic acid. By warming the acid gently it will take up an equal weight of gelatin. If the solution is too thick it should be thinned with a little acetic acid. Apply a little of the cement to the corner of the film and, when tacky, press the film into

position.

3. A third method consists in printing the line work on one slide and the photograph on a second slide, the two being bound together face to face, thus eliminating the necessity of a cover

glass.

In this case it is better to print by contact, in order to ensure accurate register. A master positive is prepared of the reading matter (reversed left to right) and a master negative of the photograph, the size of the latter being such that it just fits within the clear space on the positive.

In case a quantity of slides are to be made of the same subject this method is to be preferred.

Chemical Fog

When a photographic plate is exposed in a camera, no visible change takes place, though if the plate is placed in a chemical solution known as a developer the exposed silver bromide is changed or reduced to black metallic silver, the unexposed portions remaining more or less unaffected.

The ideal developer is the one which completely develops all the exposed silver bromide in an emulsion but does not affect the unexposed

silver bromide.

Some developers fall short of this ideal condition due to the fact that the developer is not suited to the material with which it is used, the chemicals are not properly compounded or are not sufficiently pure or for other reasons which will be covered further on.

Practically all developers, to a greater or less extent, develop a small proportion of the unexposed silver of the emulsion, producing a uniform veil or layer of silver over the entire negative which has the effect of obliterating fine shadow detail and reducing contrast when the effect is strong enough to be noticeable.

The veil of fog thus produced is known as chemical fog because it is caused by chemical action and not by light, and while it is always more or less in evidence, it is desirable to eliminate it as much as possible if negatives of the best

quality are to be produced.

The amount of chemical fog produced in any particular instance depends upon the following

factors

The nature of the emulsion. The nature of the developer. Impurities in the developer.

The time and temperature of development. Chemical fog occurs most frequently during the development of high-speed negative emulsions. Because of their highly sensitive nature they require only an infinitesimal amount of light action to record an image and if the developer is too energetic or is not compounded correctly it will develop some of the unexposed emulsion as well.

Low-speed emulsions usually give images free from fog provided a suitably restrained developer is used, though in some cases the developer that will give a clean image on a high-speed emulsion will fog a slow emulsion like that of a lantern slide plate. It is therefore advisable in all cases to use the developer suited to the emulsion.

All photographic emulsions will fog with age,

(509)

the rate of formation of the fog being hastened by

heat and moisture.

A new emulsion will also give fog if exposed to certain chemical agents such as coal gas, sulphuretted hydrogen or the vapors from benzol, turpentine, etc. The amount of fog so produced depends upon the strength of these various chemical agents, temperature, time of action, etc. It is important to store all sensitive photographic material in a cool, dry, well ventilated place.

Chemical fog caused by the nature of the developer (assuming that the chemicals are pure), depends upon the proportion of each ingredient present. To secure the ideal result it is not possible to use one developer for all kinds of plates

and film.

The common developing agents, elon, hydrochinon, pyro and kodelon (paramidophenol) under normal conditions show very little difference in the amount of fog produced. Any differences are due either to impurities or to oxidation during development.

The oxidation products of kodelon produce very little fogging action even at high temperatures, which makes it specially suited for tropical

development.

The limiting proportion of the developing agent used in any formula can only be found by trial, but it is seldom more than 150 grains to 32 ounces. Increase in the proportion of elon beyond this usually gives fog, though in the case of hydrochinon an increase in the proportion may prevent fog.

An increase in the amount of carbonate, which is the accelerator, will cause fog, because it gives the developer so great a reducing power that some of the unexposed emulsion is also reduced to

metallic silver.

Sulphite in the form of sodium sulphite, bisulphite or potassium metabisulphite is added to the developer to prevent oxidation caused by the exposure of the developer to the air. The proportion of sulphite necessary to prevent oxidation fog is usually about 1½ ounces to 32 ounces of water, though if sulphite is added in considerable excess of this sulphite fog is produced. Silver bromide is appreciably soluble in sulphite of soda and with an excess of sulphite the developer will reduce to metallic silver some of the salt dissolved away from the emulsion.

The restrainer, usually in the form of potassium bromide, is added to the developer when mixed to prevent chemical fog. Only sufficient bromide should be used to compensate for impurities or the slight fogging tendency of the developer used. In cases of known over-exposure more bromide may be added, but always before the plates have been placed in the developer.

Impurities in the developer are the chief cause of development fog. During development, several oxidation processes are going on. The developing agent is being oxidized by the air and it is oxidized itself by virtue of its reducing action in changing the exposed silver salt to metallic silver. The oxidation products formed in this way cause a powerful fogging action, especially in the case of elon and hydrochinon. The oxidation product of pyro is present when the developer turns brown, but exerts little or not

fogging action except when present in strong solution.

A third oxidation process is sulphite oxidation or the formation of sodium sulphate. Sulphate has no fogging action, though the formation of sulphate reduces the preservative action of the sulphite and thus causes fog. A small trace of copper will increase the rate of oxidation of a sulphite solution and produce fog in a developer, while the rate of oxidation of a pure sulphite solution decreases as the strength of the solution increases. This shows the necessity for the use of the correct amount of pure sulphite.

Although a developer formula recommended by the manufacturer usually contains enough sulphite to prevent excessive aërial oxidation during development, oxidation products are formed if the developer is not mixed properly. It is important to observe the following rules:

1. Dissolve the preservative before adding the

developing agent.

2. Thoroughly dissolve the developing agent before adding the carbonate.

3. Mix the developer as cold as possible.

If the developing agent is dissolved before adding the sulphite, the small amount of dissolved air in the water is sufficient to form enough oxidation product to cause fog.

In the case of elon instructions are usually given to dissolve the elon first, because it is not readily soluble in a sulphite solution. A very small quantity of the sulphite may be dissolved first, then the elon and then the remainder of the sulphite.

If carbonate is added to the solution before the developing agent is dissolved, each crystal becomes oxidized at the surface, thus causing fog.

A third cause of fog is mixing the developer too hot. Heat hastens the rate of oxidation of the developing agent, especially after the carbonate is added. And if the developer is strong in carbonate it will give fog if mixed warm even if the ingredients are mixed in the right order.

In the case of developers containing no bromide it is absolutely necessary to mix the developer with cold water if the minimum of fog is desired.

Oxidation products are usually formed in the developer on keeping, but it will keep for a long time in full bottles well stoppered and free from air.

Fogging agents may be present as impurities in the chemicals used. If the developing agent is strongly colored the presence of fogging agents may be suspected though such is not always the

Many metallic compounds such as salts of copper, tin, metallic sulphides, etc., exert a powerful fogging action even when present in minute quantities. Red rubber tubing is a common cause of fog when used to draw the developer from its container. The carbonate in the developer dissolves the antimony sulphide used as a filler in the red rubber and thus causes the trouble. Stale sulphite containing sulphate is also an indirect cause of fog.

In the process of developing a plate with a developer containing carbonate of soda, sodium bromide is formed in proportion to the amount of silver reduced. With the usual amount of developer and a fully exposed plate this bromide

will retard the formation of chemical fog, but with a very small amount of developer the retarding action may be more than is wished. In developing an under-exposed plate, only a small amount of silver is reduced and the sodium bromide formed is not sufficient to prevent fogging.

fogging.

The temperature of the developer should not exceed 70° F., nor should development be forced in case of underexposure. After the image has been fully developed and the maximum contrast secured, only fog will be formed by further development and this will destroy the quality

of the negative.

If the developer you use produces fog the remedy will often be found by adding a small amount of potassium bromide to the developer

before use.

Dichroic fog has been explained in these pages, but its cause will bear repeating. It forms a more or less uniform veil over the entire plate, appears yellowish green by reflected light and reddish pink by transmitted light, the name given it meaning "two-colored fog." This fog is composed of ultra-microscopic particles of metallic silver, the color being determined by the size of the grains, the smallest particles being red.

Dichroic fog may be formed either in the developer or the hypo. When formed during development it is due to the presence of some solvent of silver bromide, such as hypo, ammonia, or an excess of surphite or carbonate, when under certain conditions the dissolved silver bromide is reduced to the finest imaginable particles of metallic silver, particularly in the shadow portions of the negative where no bromide is liberated during development. It may be prevented by the addition of a small amount of potassium iodide to the developer.

The formation of the fog most generally occurs during fixing, especially if the fixing bath does not contain acid or if it is old and exhausted, when it is most likely to contain an excess of dissolved silver and spent developer. It is possible to obtain dichroic fog with a fresh solution of plain hypo, in which case the silver dissolved by the hypo is reduced to metallic silver by the developer carried over by the plate to the fixing bath. This is especially true if the fixing solution is warm and the developer does not have time to diffuse out of the gelatin film before the hypo begins to dissolve away the silver bromide.

Dichroic fog never occurs in a fresh acid fixing bath if the plate is rinsed well before fixing and the bath is not warmer than 70° F.—Photo

Digest.

Dishes and Soap

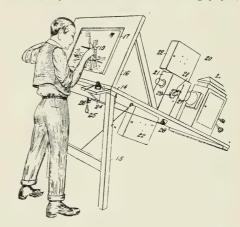
FOR cleaning xylonite and similar dishes, sapolio or any other soap with which an abrading material is incorporated is most efficient: and if this is applied before the dish is allowed to get dry there is no photographic dirt which it will not remove.

Porcelain dishes should not be cleaned with these soaps, as they tend to damage the glaze and when once the glaze has become imperfect, not only does the dish readily stain but it becomes impossible to make it chemically clean, scrub how we will. A brush and ordinary soap

should therefore be used for such dishes for any dirt that cannot be removed by a rinsing.

Making Cartoon Cinematograph Films

A FILM specially taken or any suitable film is taken, and the pictures on the film projected, one by one, in proper succession, by a suitable apparatus, preferably arranged as in the drawing, in which an inclined platform is shown, supported by suitable legs. A frame or easel at the upper end of the platform carries a transparent support (glass plate) upon which is placed translucent material, say a sheet of suitable tracing paper,



on which the artist traces (preferably with pen and ink) the lines of each picture, or such element thereof as he wishes to utilize, altering other features as his fancy may dictate, and thus producing pictures which in pose and certain general features correspond to the film pictures, but differ therefrom in other particulars so as to produce the cartoon effect. A projecting apparatus is employed, which part of the device includes a suitable projecting machine. It will be understood that each picture remains projected on the sheet until the artist has completed his tracing, then the sheet with the tracing is removed, another (blank) sheet is substituted, the film is fed to project on the blank sheet the next picture to be traced, and the tracing or drawing operation is repeated for this new picture. In some cases a continuous web might be used, preferably passing from one roller to another. Jacob Frank Leventhal and Max Fleischer, New York, Patent No. 117,839. (July 30, 1917).

Retouching Hints

NEGATIVES which have to be retouched should be carefully rubbed with cotton when taken from the washing water. If they are simply rinsed, and put in the rack to dry, there is almost certain to be a deposit of lime or other substance left on their surfaces. This deposit is a cause of trouble when the negatives pass into the retouchers' hands. Unless the medium is rubbed all over the negatives there will be transparent patches where the medium has rubbed off some of the deposit. These patches will show in the prints. Further-

more, some of the deposit will have become so firmly attached to the film that the medium will not have removed it. This will cause a grittiness which is very annoying to the retoucher.

If the retoucher finds that the deposit has been left on a negative, he should clean the surface with alcohol and a soft rag before applying the

medium.

Unless a negative is absolutely dry the pencil will dig into the film, and the work will be scratchy. It is always a good plan to warm the negative in front of a fire, or over a gas ring, before starting retouching. This will get rid of any moisture absorbed from the atmosphere. The negative must be allowed to cool before applying the medium.

Greasiness of the film is a frequent source of annoyance to the retoucher. When this is met with, the negative should be immersed in a 2 per cent. solution of ammonia for a minute, rubbed gently with a piece of cotton, washed for

a quarter of an hour and then dried.

It is a mistake to use one kind of medium for all classes of work. A fairly thick or "tacky" medium should be used for large negatives with masses of shadow which have to be filled up broadly. A much thinner medium is necessary when working on small negatives with fine detail. The "tacky" medium takes the pencil freely. This is an advantage in large negatives where a certain amount of roughness is not a drawback. The thin medium takes up less lead, thus helping to keep the work close and fine which is always desirable in small pictures with fine detail.

When you have put all the lead you can on a part of a negative, and you want to add just a little more, it is a good plan to fold up a tube of paper and to breathe slowly through it on to the part of the film requiring more work. This will revive the tooth of the medium, and restore its stickiness, when a little more work can be added. The negative must be well dried after this treat-

ment before printing.

It is not generally known that a negative may be given a matte surface, without injuring the film, by rubbing all over it with fine pumice powder. Only the finest pumice should be used for this purpose, and the best way to apply it is to rub it on with the palm of the hand, working with a circular motion. Any amount of work can be done on a film treated in this way. It is a useful method for improving large negatives containing harsh contrasts, but it is not recommended for small pictures with delicate detail.

So many new methods for toning down harsh lights have sprung up in recent years, that some of the older ones have been almost forgotten. Some retouchers with long years of experience, however, say that they have found nothing better than ordinary ink eraser for rubbing down very dense patches in a negative. The best way to use it is to take a piece of thin celluloid and in it cut an opening the size of the patch to be rubbed down. When this is laid on the negative the ink eraser can be used freely without the risk of damaging the surrounding parts. It is wise to practice before using this method on regular work.

The study of anatomy is almost essential to

the retoucher who wants to produce really good work. It is not necessary that he should know the names of all the facial muscles; his studies should be directed more to the careful observation of living faces than to learning long strings of Latin names from text-books. A great deal can be learned by looking at engraved or etched portraits by good artists. The direction of the lines should be carefully studied. It will be seen that, as a rule, the lines follow the contour of the various forms of the features. For instance, the lines of shading of the nose, mouth, eyelids and ear generally follow the forms of the particular parts they represent.

The forehead is generally over-retouched by inexperienced workers. One look at a forehead will show that it is not a flat surface, but that it is made up of a series of undulating curves. It should not, therefore, be worked up until it is of one even tint all over. There is an old saying among painters that the highest light in a portrait should be the part that would first get wet in a shower of rain falling in the same direction as the light is falling upon the sitter. In ordinary studio lighting this would be the forehead. As a rule, then, this is where the highest light, apart from the reflection in the eye, should be in a

photograph.

In working up hair it should be remembered that the touch required is quite a short line. It is hair in the mass, and not a number of separate hairs that should be represented by the retouching. You cannot work in such a way that each pencil line represents one hair. If you attempt this you will make the hair in the portrait look

like wire or string.

Everyone knows that when the corners of the mouth turn down they give a sad expression to the face, and that when they turn up the expression is suggestive of mirth. The matter, however, is not quite so simple as this statement would suggest. Every expression is not a question of one feature only but of the whole face. In laughter the upturned corners of the mouth alter the lines between the nose and the mouth At the same time the cheeks are raised and little lines appear around the corners of the eyes. These points should be remembered when altering the expression of a portrait.

The wrinkles which gather at the outer corners of the eyes must not always be regarded as a sign of age. They are often found in young people of a happy disposition. In fact, these lines come and go in most people as the cheeks are raised in laughter or lowered when the features are in repose. It is quite a mistake then for the retoucher to make a point of always working out "crow's feet" in all portraits except

those of old people.—Photo Digest.

The "Restoration" of Daguerreotypes

Professional photographers are sometimes called upon by their customers to copy a Daguer-reotype portrait, the image of which is nearly obliterated, or, to use a more customary term, "faded." Bad as the state of the picture may be, it is usually highly prized by its owner, who may have heard that such pictures can be "restored." The photographer, perhaps, may have

no idea as to how to do the work, nor is it surprising that the majority of the present generation of photographers should not be au fait with a process that became obsolete some forty or more

years ago.

Few, except those familiar with the process, recognize how extremely tender is the Daguerreotype image, although it is in reality the most permanent of all silver pictures. The image, it may be mentioned, is not supported by a film of any kind, nor is it protected by one, as in the case of a collodion or gelatin picture. It is merely on the surface of the metal plate, and can easily be removed with the finger, and a slight touch may be quite sufficient to leave a mark which no after-treatment will remove.

Briefly, the Daguerreotype process is as follows: A silvered copper plate has its surface brought to an exceedingly high state of polish, *i. e.*, until it is quite black. As a matter of fact, it is this black polish that forms the deepest shadows of the picture, and the higher the polish the more vigorous the picture. This highly polished surface is exposed to the vapor of iodin, then to that of bromine, and again to iodin. The iodide of silver is thus formed direct upon the bare metal. After exposure in the camera, the plate is submitted to the fumes of mercury, by which the image is developed. It is then fixed and afterward "gilded"—that is, toned with gold.

Now, what takes place when a Daguerreotype "fades" is that the silvered surface of the plate becomes tarnished and the tarnish obliterates the image. But the picture is still there, and it is only necessary to remove the tarnish to make the portrait as good as it was at first, provided it has suffered no mechanical injury. If the picture was hermetically sealed, and kept so, so that the air did not obtain access to it, there would be no so-called fading. This sealing up the producers of Daguerreotypes were always careful to do by binding the picture, mat and glass together at the edges with goldbeater's skin, or a hard-sized thin paper. In nine cases out of ten when a Daguerreotype has faded it has been taken out of its case, unsealed for copying, and then simply put back again without the trouble being taken to secure it against the atmosphere. Hence the deterioration, which always proceeds from the margin inward. Often the center of the picture is quite good, while the edges are nearly black. It is obvious that the image being in the attenuated form just described, and having no film to hold it as in the case of collodion or gelatin pictures, mechanical methods, such as polishing, are out of the question; and, therefore, chemical means must be resorted to in order to get the tarnish away. Cyanide of potassium is the agent to be employed, and we will now describe the manipulatory details.

The picture is taken out of its case and the old securing paper cleaned off the back, carefully avoiding any particles getting on the front. there is any dust on the picture which cannot be blown off it should be allowed to remain, as it will be removed in the next operation. Its removal, even by a camel-hair brush, if it be of a gritty nature, would be liable to scratch the image, and a scratch once made cannot be eradicated. The next thing is to wet the picture evenly, and this

cannot be done direct with water, as the surface is very repellent to that fluid. The plate is first flooded with alcohol for a minute or two, and then put under a gentle stream of water from the tap, until all apparent greasiness is removed. Then, having ready a solution of cyanide of potassium, a little is poured over the plate and flowed backward and forward until the tarnish has been dissolved off. No definite strength for the solution can be given as the cyanide for commerce varies so much—from 30 to 90 per cent. The best way, therefore, is to make up a pretty strong solution and then add a little of it to some water, gradually adding more until the tarnish begins to yield, and then allow time for its complete action. solution may be used in a dish; but the better method is to pour it on and off, as then it can be applied locally, if desired. The tarnish having been removed—the picture restored—the plate is well washed under the tap, and finally rinsed with distilled water. If the final washing is with common water a thin veil is left from the lime or other impurities in the water. The picture is dried, and the drying must be done properly or streaks will be left. The method is this. The plate is held by one corner—say, the bottom left hand one—with a pair of pliers and flooded again with distilled water and drained from another corner, say, the right hand one. From this point the slope of the plate must not be changed. The flame of a spirit lamp is then brought under the highest corner, and as this dries the plate is gently raised so that the drying proceeds reg-ularly downward. If there is a stoppage in the drying a mark will be caused which it is almost impossible to get rid of. In the drying, too much heat must not be employed, or some of the mercury forming the image may be vaporized and the picture weakened.

The work being finished, it only remains to hermetically seal the plate and replace it in its case. This is done by binding the picture, the mat and the glass together with a thin hard-sized paper or goldbeater's skin, as lantern slides are bound up. The best cement, perhaps, is flour paste; but gum should not be used, as when dry it is liable to split off the glass and metal. Most of the glass used for glazing Daguerreotypes was thick, and had its edges ground to give a tooth

to the cement.

Although we have given very full details of the method of cleaning Daguerreoptyes, we would strongly advise our readers, in view of the delicate nature of the image, not to attempt the work on a valued picture before they have experimented on one or two of little or no account.

Negative Drying

In certain localities trouble in drying negatives evenly is experienced in cold damp weather, and even in the warmest weather when there is considerable humidity.

This trouble is often due to placing the negatives too close together in the drying racks, the result being a sharply defined edge to the portions

which have not dried.

When negatives are left to dry over night and the studio is opened the next morning and the work rooms ventilated, the weather may have

changed, the air cleared up and the portions of the negatives that remain damp dry very quickly with a marked difference in density and the dry-

ing mark mentioned above.

No after-treatment has ever been found that would remove such a mark. If negatives have dried slowly in a closed room, close together in the racks, the only way to save them is to keep the room closed and allow them to finish drying under those conditions.

The best way to prevent drying marks is to dry the negatives quickly. All of the surplus moisture should be wiped from the front and

back of the negative with a damp pad of cotton. Negatives should be placed a couple of inches apart in the racks and once they have started to dry in one room should not be carried into another. Or if drying has begun in a well ventilated room the room should not be closed later on and the rate of drying changed.

If the air is damp it is advisable to heat the drying room before the negatives are placed in it for drying. There will then be little chance of their not being dry by next morning. Every studio should be equipped with an

electric fan for quick even drying, the results being most satisfactory in every way. The time saved in drying negatives ready for proofing enables one to show proofs before the sitter's enthusiasm begins to wane, and orders are almost invariably larger.

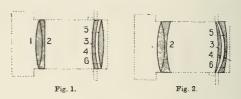
Thin negatives are considerably intensified by quick drying and the combination of a fan and heat may be used to advantage in drying such negatives. Precaution should be taken to see that an inexperienced apprentice does not turn the negatives upside down in the racks once they have begun to dry.—Studio Light.

The Portrait Lens and Its Adjustments

Although there are now upon the market many lenses of great rapidity which are eminently suitable for portraiture, the distinctive title of 'portrait lens" is almost exclusively applied to instruments of the Petzval construction or of the Dallmeyer modification of it. Generally the intensity of the Petzval type of lens ranges between f/2 and f/6, while the maximum intensity of the larger anastigmats is about f/3.5. Hence it will be seen that the latter possess the essential quality of rapidity to almost the same degree as the older form of "portrait" objective. Although it does not quite come within the scope of our title, we may be forgiven for reminding readers who are inexpert in optics that the construction of a lens has no effect upon the "drawing" or perspective of the photograph. Lenses of equal focal length give similar results at the same distance; definition and covering power may differ widely, but the size of image and relative size, say, of hands, feet, and head in a sitting figure will be the same.

The original construction of the Petzval portrait lens as first made by Voigtländer in 1840 has been little altered up to the present time. The only modifications are those necessitated by variations in the nature of the glass employed. The accompanying diagram (Fig. 1) shows the form and position of the various glasses, the open

surfaces of which are distinguished by numbers, the dotted outline representing the mount. In many lenses the glasses are not permanently fixed into the brass cells, but dropped in and secured by a clamping ring or "counter cell." It is, therefore, necessary to be very careful, if they have been removed for any purpose, that they are replaced in their proper positions, for if this be not done the lens will be rendered useless



for the time being. The front combination is dropped into the cell with the convex side downward and held by screwing the counter cell home until there is only the slightest play between the glass and metal. This is tested by shaking the cell while it is held close to the ear. If the counter cell is screwed home tightly there is danger of putting a strain on the glass and impairing the definition. There is a much greater chance of mistake when assembling the back combination, as here we have two lenses each of which may be wrongly placed, or the whole combination may be reversed. Reference to the diagram will make the proper arrangement quite clear. On looking through the glasses it will be seen that one magnifies objects and the other diminishes them. Take the magnifying lens and examine the two curves. It will be found that one is flatter than the other. Put the brass cell upon a table and drop in the lens flat side downward (Curve 6, Fig. 1). Put in the brass separating ring and drop in the diminishing lens, hollow side down (Curve 4, Fig. 1). Screw in the counter cell in the same way as directed for the front lens. The commonest error is to reverse the position of the surfaces 5 and 6. If this has been done the central definition will not be impaired, but it will fall off very rapidly, only a very small circle being properly covered. Most English opticians burnish the glasses into the various cells so that it is impossible to disarrange them, and this affords a slight check on forgeries. So far as we know, Ross, Dallmeyer, and Grubb have always done so, so that if a lens bears one of these names and has the loose lenses and separating ring, it should be looked upon with suspicion.

The Dallmeyer portrait lens patented in 1866, although similar in the general idea, has important differences in construction. It will be noticed from the diagram (Fig. 2) that surface No. 2 has quite a deep curve instead of being nearly flat as in Fig. 1, while the form of the two back glasses is not only different, but their positions are reversed, the diminishing lens being placed outside or next the plate. Lenses of this construction have also been made by Ross and Swift, and the glasses are always burnished into their cells, so that displacement is impossible. Lenses of this type have a very useful quality, generally known as "diffusion of focus," that is to say, by altering the distance between the sur-

faces 4 and 5 (Fig. 2) any degree of unsharpness can be obtained. When these surfaces are as close together as the screw thread will allow, the definition is quite sharp, but as the back ring of the back cell (not the entire cell) is rotated, the definition becomes softer until, with a large aperture, it becomes distinctly fuzzy. All the earlier Dallmeyer "Patent" portrait lenses had notches cut in this back ring thus: I II III IIII, with a small brass pin to serve as a pointer. These notches indicated the degree of unscrewing up to a whole turn. Two or even three complete turns may be given if desired. A few years ago a new form of mounting was introduced which enabled the diffusion arrangement to be worked by rotating the entire lens in its flange, the back cell being rigidly held. It should be noted that focussing should always be done after unscrewing the diffusing arrangement and not before, as the focal length is slightly altered by so doing. It may be as well to point out that no perceptible alteration in definition can be obtained by varying the distance between the two back lenses in the Petzval model (Fig. 1), nor by unscrewing the back cell as a whole. Variations in the length of the tube have, however, a considerable effect on the covering power of the instrument. Shortening the tube reduces astigmatism, but introduces curvature of field, while lengthening it has the reverse effect. Some makers have introduced a sliding adjustment for this purpose. The wellknown French optician Derogy fitted many of his lenses thus, while they had in addition supplementary combinations for lengthening or shortening the focal length, these being introduced between the usual combinations.

The terms "crown" and "flint" are often applied to the various components of lenses. Originally they referred to the actual varieties of glass used, but in later years mainly refer to the form of the lenses. Thus, lenses which are as a whole convex, or magnifiers, are usually called "crown," while those which are concave or diminish are styled "flint." This will explain any references to the "back crown" or "back flint" lenses which may be encountered in

popular books on lenses.

Lenses of the Petzval construction are frequently employed for purposes other than portraiture. For example, these objectives are usually sold with enlarging lanterns, and are fitted to cinematograph cameras and projectors. The lenses on the better class of magic lantern are of similar construction, but cannot be relied upon to be corrected for photography. can, however, be ascertained by a trial, and the result may be that a useful lens, for small portraits or great enlargement when copying, is discovered. Many of the cinema lenses are of

discovered. Many of the cinema lenses are of great intensity, f/2 or over, and may be useful for ordinary work on small plates.

The word "portrait" is often used in conjunction with "Euryscope" or "Aplanat," and simply indicates a greater degree of rapidity than is usual with that particular type of lens. Similar lenses were called "Extra Rapid Rectilinears" by Dallmeyer and "Universal Symmetricals" by Ross.

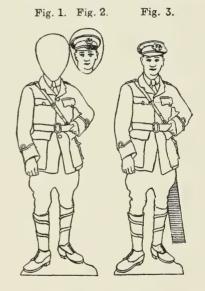
One useful modification of the portrait lense.

One useful modification of the portrait lens, whether it be Petzval or Dallmeyer, is the use of

the front lens alone, the back being entirely dispensed with, for soft focus effects. The focal length is, of course, much greater than the complete lens, hence it is better adapted for large heads. If used in its normal position a moderate degree of softness or diffusion is obtained, while if placed at the back of the tube in the thread usually occupied by the back lens the image is still further softened. This gives a useful mean between the extreme sharpness of the ordinary lens and the pronounced fuzziness of the anachromats.—British Journal of Photography.

Combination Photographs

The invention consists in the method of making photographic representations of persons in uniform or other costumes, which consists in first photographing a person in any desired uniform or costume, removing the head and neck from such photograph, affixing the prints of the photographs (minus head and neck) to cardboard or the like. A hollow cutter is formed the



shape of which corresponds to the outline of the photograph, but with an outline at the top of the cutter considerably larger than the head and neck. The prints of photographs affixed to cardboard are cut out with the cutter (with a blank piece of cardboard at the top larger than the head and neck). Then a photograph is made of the head of any person desired of corresponding scale to that of the body and a print of the head affixed to the blank portion of cardboard at the head of the body, and then the extraneous cardboard is cut away by hand around the head and neck, to thus form the finished photographic representation. In the drawings Fig. 1 is the representation of a person in uniform with head and neck removed, cut out to the outline with a hollow cutter. Fig. 2 represents the head of a person of corresponding scale to be affixed to the blank space above collar shown in Fig. 1. Fig. 3 is the finished representation after the head, Fig. 2, has been affixed to the space above collar in Fig. 1, and after the extraneous portion of cardboard around the head and neck has been cut away.

A Wax Medium and Process for the Permanent Coloring of Photographs

IF, in any work to be executed in azure and best sinopis, he shall be found by the dean and the jury to have cheated with the materials, the delinquent shall incur a penalty of 10 livres parisis."—Dalbon's Origines de la Peinture

à l'huile.

Much time, thought, and search was given in the nineteenth century to discover the secret of the great old masters why their colors retained sweetness and purity of color, and what was their perfect technic which preserved their work for nearly four centuries. When in olden times such a clause as the above was part of the artist's contract, and when they had to prepare and grind their own colors, therefore using them carefully and sparingly, their secret is obvious. The result was also to a great extent brought about by the severe regulations framed by associations, guilds, and bodies of master painters, and it would be a good thing if guilds were in existence today, because, with large firms and big banks amalgamating, it is not difficult to prophesy that they will have to be reëstablished in order that craftsmen and trade workers may

Artists have now a far better selection of permanent colors than the old masters, but they still have to find a perfect vehicle that is easy to work with, without chemical action upon colors, possessing protective qualities, and, above all, permanent. Painting struggles with difficulties; all sorts of agglutinants have been tried to help to produce opacity, transparence, dryness, and the appearance of moisture with contradictory obstacles. The importance of the vehicle is manifest in many ways; it means a different process, with its advantages and disadvantages, according to the agglutinant used, their proportions, their action on colored powders, and is the all-important question to those engaged in

coloring photographs.

Wax, which seems to answer nearly all our exact requirements, is well known, but in little use, the reason being apparently that it requires special treatment to make it amenable to artistic use. In order to understand its virtues we must compare it with linseed oil and varnish, the two most important binding vehicles in use. distinguished French painter and chemist Vilbert did not believe in the use of linseed oil, but used a resin varnish reduced with benzine. Gersaint, who knew Watteau personally, deplores his abuse of oil, and adds: "It must be admitted that some of his pictures are perishing in consequence day by day; that they have changed color completely, or have become very dirty, and that nothing can be done to mend matters; but, on the other hand, those which are free from this defect are admirable, and will always hold their own in the finest collections.' In *Picture Making*, C. J. Holmes says: "The oils used in painting, however carefully they may

be clarified and refined, tend with the lapse of years to rise to the surface of a painting and form a semi-resinous coating of brown or yellow, which certainly darkens their tone and destroys their freshness. The painter is thus compelled to get rid of every superfluous atom of oil in his picture if he wishes it to retain its pristine brightness. One can say, without exaggeration, that many pictures have been spoilt by a bad quality resin-ous varnish, badly applied. Varnish has destroyed hundreds of engravings, mezzotints, and the like, which it ought to have protected, instead of which it deteriorates to such an extent that it becomes darker than tar, proves worse than useless, and is responsible for 75 per cent. of the cracks, apart from some varieties being subject to bloom. You have to rely upon a firm's reputation, and if you should find a great change in the varnish after a year or so, the manufacturers kindly inform you they give no guarantee. Now, if we can make our own vehicle we shall be somewhat in the position of the old masters, knowing what we are using, and meeting the question of permanence more than half-way. Volumes have been written on the subject of oil and varnish, but enough is said here to prove that transparent oil is not permanent, especially on paper, which is the point that matters to photographic artists.

Virgin wax is free from the faults just mentioned, and is the material the ancients believed in, so much so that clothes were dipped in it to wrap round their dead. Ancient writers speak of the use of wax for painting, but not of their methods, so their technic is unknown to us. All great artists have been interested in the question, and yet very few experiments have been made as to the utilization of exotic and vegetable waxes in the process of painting. The Hon. J. Collier in his book, *The Art of Portrait Painting*, writing of Sir Joshua Reynolds' technic, says: "Later he seems to have adopted Venice turpentine and wax almost exclusively as a medium for the heads, while the draperies were painted with wax without the turpentine, thus getting a richer

impasto.'

Raffaëlli, in 1903, created some sensation in art circles by inventing his "pencils of paint," after the manner of pastel, ready for use. His discovery is a derivation from encaustic, and the sticks seem to be composed of a similar mixture. His success would have been more lasting if he had introduced a cerate paste or medium.

had introduced a cerate paste or medium.

The following wax medium was put forward the end of last year:

To make the medium:

White wax (bleached beeswax) 1 oz.
Carbon tetrachloride 1 oz.
Turpentine 1 oz.
Benzine (refined naphtha) 1 oz.
Ammonia .880 1 dr.

Melt the wax in a jar standing in a saucepan one-third full of water, and then add the carbon tetrachloride, remove from heat, and add, drop by drop, the ammonia, stirring all the while. When it has done frothing, add the 1 oz. turpentine, heat up again for a moment, remove from heat, and, when cooler, add the benzine and stir well for a minute or so.

For safety's sake, use a larger vessel than necessary to hold the quantity required—say, 1 lb.

jar for 4 oz.

The object of the carbon tetrachloride was to make the mixture in the heat less likely to catch fire; also to assist a small quantity of ammonia to saponify the wax, because an excess of ammonia discolors the wax to a golden brown. Wax will not amalgamate with oil; the adhesion of the various coats of color is not perfect, but when saponified it is so. Carbonate of potash will saponify wax, with water to start the action, but water also makes this reagent faulty. evaporates out, leaving small pinholes in the film of varnish, and is therefore objectionable, and if carried over water-colors it is liable to disturb the painting.

An improved method of making the wax

medium is:

White wax (Cera Alba)		$\frac{1}{4}$ OZ.
Spike oil of lavender		$\frac{1}{2}$ OZ.
Hard primrose soap	٠.	1 dr.
Gum elemi		2 dr.
Turpentine		$3\frac{1}{2}$ oz.

Gum elemi is for hardening the mixture, and should be dissolved in $\frac{1}{2}$ oz. turpentine and

strained to get rid of the grit and dirt.

Place the soap on a plate and, with a tableknife, knead it with oil of lavender until you get a jelly, gradually adding about $1\frac{1}{2}$ oz. of turpentine. Next melt the wax in a small jar, add 1 oz. turpentine; when cooler—say, 70° F.—add the gum elemi and the turpentine jelly, stirring well for a minute or so. Store in a glass jar with box-

wood cork stopper as most convenient.

From the jar of medium take a small quantity and mix it with a little powder color, or oil color, to the required depth of tint with a palette knife on the palette (a china one is best). Then, with a soft piece of rag over the tip of the index finger, rub the tint over the enlargement or picture to be colored. If the tint is too dark, use more medium; if too light, add more color, spreading well over the part to be colored. It is important that the color, when laid on, should be of the right consistency—i. e., it should have the right proportion of color, medium, and oil of turpentine. smaller the surface to be painted the drier should be the paste, but too dry a color forms a granular appearance or layer on the photograph. Suppose you wish to color an admiral's coat, tint the medium with Antwerp blue, rub evenly all over, and then, with medium, or the rag moistened in turps, wipe off clean the buttons and gold braid parts and tint with chrome yellow or gold color to your liking. Similarly, the face, eyes, and lips are easily wiped clean for the final touches with brushes or stumps.

Before you begin, remove all black spots caused by pinholes in the copy negative and other dark markings likely to be detrimental in the usual way; next tint all the big masses first and smaller next, and then, with lead pencil, touch out white spots. Large spots need touching up with color and brush. For the eyes (small work, lines, and markings) use a brush of suitable size. If the photograph is a good one, the process is a simple matter, but if showing enlarged retouchings, etc.,

waterproof spotting is best, as recently explained in the "B. J." and should be done first.

The advantage of using powder color is that it dries more quickly; oil retards the drying. Palette and brushes are easily cleaned with turps, benzine, or petroleum spirit. Do not use more medium than is necessary to get the desired result. If the face is delicately modelled, use a transparent flesh color, and if the shadows are too dark use an opaque mixture. If powder colors are not to hand, take oil colors; if they are of poor quality or contain an excess of oil, spread on blotting paper or a slab of plaster of paris to absorb the oil, then transfer it to china palette. The deep shades of pastel, being nearly pure powder, can be made into a colored paste with the medium and used.

The process presents the following advantages: 1. It is easy to color large surfaces easily and

uniformly.

2. The color can be entirely removed by turpentine without affecting the photograph if the coloring is not to your liking.

3. The colors dry fairly quickly, yet time is

given for the passage in hand.
4. The medium will carry a tint over dry water color without moving the underlay.

5. The texture of the photographic image is

left unchanged.

6. It possesses the power of adhesion to the surface of photographic paper to a superior degree than water color.

7. It has remarkable spreading qualities; is

easy and pleasant to work with.

8. The paint is more pliable, therefore eminently suitable for work on paper.

9. Does not pucker up like oil; does not crack or fissure; no retouching medium required or the need for "oiling out" as with oil painting.

10. No preparation required before beginning

11. Unaffected by acids and has protective qualities.

As may be expected, the process is equally effective for B. and W. finishing, and when one thinks that in many cases a mere transparent film is required to take off the death-like look in enlargements, that the work is done more quickly than it can be described, and that no visible trace is left of the means employed, it should prove most useful.

Those who have had any experience at all in finishing work know that the grain of the paper is a great factor. Matt papers with a fine grain are preferable to smooth ivory surface or glossy variety. Except glossy P. O. P. for dye-work, all glossy paper should be avoided, but if one is obliged to color on glossy with the medium, color all over as described, set aside until next day to harden, and then polish with a clean brush as used for cleaning silver; or warm the work in front of the fire or by means of a stove until the wax comes to the surface of the color work and leaves a gloss.

Although wax and turpentine are used in this process it is not what is called encaustic, which is wax and color heated by means of metal palettes, a moderately hot iron being used to fuse the tints

and make the result less flat in tone.

If you have a dark subject, e. g., black dress

against dark brown background, the picture can be varnished to give depth, the same as Raffaëlli

colors can be varnished.

Some may say, why bother about another process when we have water-color which many find more permanent than oil-color? But portraiture in water-colors presents almost insur-mountable obstacles if the demand is for a medium-sized head, carefully finished, with some pretense of flesh tone and a realistic likeness. From Rembrandt, who used washes of sepia, to our own Sargent, who has today a full palette at his disposal, and has produced masterly landscapes in the medium, the water-color portrait is missing, proving the process unsuitable. Therefore, the masterpiece for students to study is likely to remain practically unknown; this condition of affairs is largely contributed by the difficulty of using Chinese white.

Pastel is a colored dust laid dry on to a surface to which it scarcely adheres, and, when fixed, looks like distemper, and makes very little head-way in the arts. Oil painting alone survives, but even that hardly fulfils the most modern requirements. First, in order to apply the color to paper or canvas with a brush, it is necessary to add ten times more oil than is requisite, and all the mischief comes from the excess of oil. Varnish, unless skilfully used, is apt to make an enlargement look cheap and "Whitechapelly"; a dead matt finish looks superior, and has been proved by experts to reflect more colored light than a varnished surface. It often happens to the finishing artist to have a print over-exposed; the background and clothes, when colored in water-color, appear passable, but the flesh is a tone too dark. Oil colors are objected to as shiny, though wanted for covering power. If, however, a wax medium is used to give a dead matt effect, the result is in keeping with the rest of the picture. Paint quality, which learners find difficult to acquire, is due to the peculiarity of oil and varnish; with cerate paste a quality is easy got, either a luminous transparent film of color, pearly translucent tints, or opaque color, without any messy appearance.

Many photographers have ability for coloring, merely requiring an easy means of applying colors, and as it is like making a scientific analysis to describe some tints accurately, they are in a position to do good work by knowing their patrons and getting first-hand information—so much preferable to sending away their work to experts, who may or may not have the power of

color clairvoyance.

Colored photography is nearly as old as the process itself. War memorials have increased the demand, and, judging by books on color published in America, color over there is much to the front, and is likely to be more in evidence here. In reality, the likeness and the sentiment of a picture is emphasized as definitely by the colors as by its design.

Much will yet be done in color plates and color-recording papers, but it is doubtful if they will give simultaneous contrasts to which the eye is subject, and we are not told the amount of time required to get results or how plates are to be modified for color; therefore it will be well to proceed on the lines indicated.

The claim put forward here is merely a newer, simpler and more perfect vehicle for work on photographic paper, by which each worker in the field may more easily strive to hold his own in the peaceful struggle to achieve things of beauty. -A. VERNON GODBOLD, in British Journal of Photography.

The Effect of the Iron Content of Ammonium Persulphate on Its Photographic Reducing Power

It is well known that different commercial preparations of ammonium persulphate show wide variations in their behavior in attacking the density of photographic negatives. The typical peculiarity of persulphate, namely, its selective action on the higher densities, has received many explanations. In this direction the most important contributions to the chemical mechanism of

persulphate reduction are the following:

H. Marshall (Trans. Edin. Phot. Soc., 1900, 23, 168) showed that the action of persulphate on metallic silver is what is termed auto-catalytic, i. e., it is accelerated by the reaction-product, the dissolved silver sulphate. A chemical explanation of this is the ormation of an intermediate silver persulphate, which is a stronger oxidizer than the ammonium or potassium persulphate; the action in question may be considered to take place in stages represented by the following chemical equations:

1. $2 \text{ Ag} + (\text{NH}_4)_2 \text{S}_2 \text{O}_8 = \text{Ag}_2 \text{SO}_4 + (\text{NH}_4)_2 \text{SO}_4$. Very slow. This reaction, the formation of silver ions by the direct attack of persulphate on me-

tallic silver, is very slow.

2. Ag₂SO₄+(NH₄)₂S₂O₈=Ag₂S₂O₈+ (NH₄)SO₄.
Very rapid. This reaction, a purely ionic interchange, is very rapid.

3. $2 \text{ Ag} + \text{Ag}_2 \text{S}_2 \text{O}_3 = 2 \text{ Ag}_2 \text{SO}_4$. Rapid. Finally, the attack of silver persulphate upon metallic silver is also a rapid reaction.

In the absence of silver ions (or other catalyst) the reaction is slow at first, then becomes rapidly accelerated.

By adding silver ions, e. g., silver nitrate or, better, silver sulphate, to a sluggish persulphate solution, the initial retardation is overcome.

It was suggested that this auto-catalytic action of the dissolved silver afforded an explanation of the super-proportional action. This, however, is not the case. Unless other factors intervene, the rate of reaction would still be proportional to the density, so that the undoubted acceleration by dissolved silver is not a complete explanation.

Different observers had noted that the water used in making up a persulphate solution affected the action. This was taken up by E. Stenger and H. Heller (Zeit. Wissent. Phot. 9, 73, 1910). They found that, depending upon the amount of chlorides in tap-water, the type of reduction changes from the super-proportional to the subtractive. They attribute this chloride poisoning to the formation of relatively insoluble silver chloride, which lowers the concentration of the catalytic silver ions and protects the silver grain from further attack.

It can, however, be shown that even with distilled water free from chlorides the anomaly persists. Schuller (*Phot. Rundsch*, 1912, p. 236)

brought forward more definitely a suggestion often tentatively advanced, namely, differential diffusion. Schuller adopts the silver persulphate or catalytic theory, but considers that superproportional action on the higher densities is much less determined by poisoning in the lower densities.

As against these explanations, Luppo-Cramer (Colloid Chem. und Photographie) advanced a colloid chemical theory. He considers that the composition of the developed and fixed negative image is not pure metallic silver, but remains an absorption compound of silver and photo-halide. The amount of photo-halide and a fortiori of normal silver halide, is very small, but it is supposed to be greater in proportion as the exposure is less. There is then more photo-halide in the lower densities than the higher. This, he suggests, is due to a more energetic attack of the developer on the grains of the higher, more exposed densities.

Luppo-Cramer regards this as an explanation of the peculiarities of photographic reducers. Reducers with a silver halide solvent present in solution with the oxidizing agents—as in Farmer's reducer—will attack the lower densities more strongly than the upper, and we get subtractive action. On the other hand, in reducers like persulphate, or in chromic acid poisoned with soluble chloride, the lower densities having more halide are better protected from attacks.

It is to be noted that the facts and explanations brought forward still fail to account for certain minor characteristics of persulphate reducers. One of these is the already mentioned variation, particularly of initial activity, between different preparations having the same persulphate content. Another is the action of acid and alkali on this initial activity.

Luppo-Cramer, in support of his photo-halide theory, instanced the equalizing action of sulphocyanide (a silver halide solvent) upon ammonium persulphate. This combination was first recommended by Bayley and Puddy (Phot. News, 1900, p. 174) as giving a proportionate action.

In the course of some experiments intended to test Luppo-Cramer's views on the negative image, Bayley and Puddy's combination was tried. It cannot be said that it is very satisfactory either chemically or photographically. In the first place, like other complex cyanides, sulphocyanide is attacked by persulphate with the liberation of hydrocyanic acid. In the second, measurements with sensitometer strips show that there is no certainty of proportionate action.

In trying the combination with different persulphate preparations it was observed that they all reacted, more or less vigorously, for iron. Further, it was noted that the preparation showing the least initial activity, or the greatest initial sluggishness, gave the weakest reaction for iron, while the most vigorous preparation, one, in fact, very difficult to control, gave the strongest reaction.

The preparations are therefore analyzed for

iron, with the results given later.

On adding ferric sulphate to the solution weakest in iron till it was approximately equal in this respect to the strongest, the initial activities were made practically equal. Quantities of iron in excess of this relatively small amount gave reducers of uncontrollable character, the action becoming very irregular and localized.

The small variable amount of iron salt present as an impurity in ammonium persulphate is thus the cause of its variability, and iron, however introduced, is a powerful catalyser of the action of persulphate on metallic silver. The chemical reactions involved show that we have here a case where a side-reaction supplies more rapidly the auto-catalyst for the main reaction, while the main reagent re-energises the side reagent or catalyst. Iron, as a ferric salt, e. g., ferric sulphate, rapidly attacks metallic silver, forming

silver sulphate and ferrous sulphate: 4. Fe₂(SO₄)₃ + 2 Ag = Ag₂SO₄ + 2 FeSO₄, and the ferrous sulphate is rapidly reoxidized to ferric

by persulphate.

Testing a Light Filter

Now that apparatus is changing hands very frequently, many a photographer finds himself in possession of a color screen without any information as to the increased exposure which it requires. There is nothing in such a case but to find out by actual trial what difference it makes; but if this is to be done effectively certain precautions must be observed, which it is well to indicate.

It is customary to say that the effect of the screen varies according to the plate with which it is to be used, and in the strictest sense this is so. But in actual practice, we need not take this into account, unless some plates of a peculiar color-sensitiveness are in use, plates which would only be obtained to order and for a special purpose.

As far as the screen is concerned, we may divide all orthochromatic plates into two groups: the ordinary orthochromatic kind, in which are included the self-screen on non-filter varieties, and the panchromatic. It is hardly necessary to point out that the screen would not be used at all with plates which are not color-sensitive. When once we have found out the difference of exposure which it requires with any plates of one group, we shall not be appreciably wrong if we treat that result as being good for any plates in that group.

The actual increase is slightly less with "self-screen" plates than with those which have no plates than with those which have no screen incorporated with the emulsion, but it is not large enough to need to be taken into consideration in practical work. With panchromatic plates, the effect of any yellow screen in prolonging exposure is always very markedly less than it is with orthochromatic plates of any other kind.

To ascertain just what the increase is, we must make comparative exposures on the plates in general use, with and without the screen: and in order to make a single experiment tell us what we wish to know, we must see that on the plate exposed through the screen we have a varied series of exposures to compare with the correct exposure without a screen.

As the screen has a visibly yellow tint, we know that it must increase the exposure to some extent; and unless it is a very deep shade indeed, we shall be fairly safe in assuming that the increase will not be more than ten times. We may base our test, therefore, on the supposition that with the screen the exposure must be from two to ten times what is required without it. So that if we decide on the correct exposure without it, our trial exposures with it may be, say, 2, 4, 6, and 10 times that exposure. Among these four we are pretty sure to get a clear indication of what is required.

On the whole, it is better to avoid a subject which itself contains any strong colors; as the different renderings with and without the screen may make it difficult to draw any correct conclusion. If a subject is being arranged for the test, nothing is better than a cylinder of card, round which has been wrapped a newspaper, or even a sheet of white paper. The cylinder is laid on its side on a table covered with a black cloth. Such a subject is easily arranged. It is focussed on the screen, the plate being used the horizontal way. This then gives us a subject which has very marked light and shade, and is uniform from one end of the plate to the other. This is a great point in the comparative test.

The exposures must be made in good daylight; so the increased exposure which a screen necessitates varies according to the nature of the light. By any form of artificial light of the domestic kind, the increase would be much less than by daylight: and for all the ordinary purposes of amateur photography, it is the daylight result which we wish to know. If for any reason we wish to use the color screen by artificial light, then separate tests must be made by the par-

ticular light to be used.

Having set up our subject and focussed it, we proceed to ascertain the correct exposure without a screen for the plate we are using. It will be well to use the smallest stop in the lens; as there is no fear of such a subject moving, and it is best to make the exposure required sufficiently long to allow them to be timed accurately by hand. If the photographer is in the habit of using an exposure meter, he will be able to ascertain this without any trouble. If he has not, then it would certainly be best to give up the first plate to a series of exposures, and to develop it before making the test: so that he may know just what it would be. If this should mean that the preliminary trial must be made a day or more before the real test, this need not be regarded as an insuperable difficulty, provided the light on the two occasions seems to be much about the same, as it would be at the same time of day and with similar weather.

Having decided what is the correct exposure without the screen, we may proceed to give it. As a help in comparing the results, though, we may as well give, say, three exposures to the plate. Thus, if the correct exposure is three seconds, we may give a second and a half with the shutter of the dark slide drawn right out. Then pushing it a third of the way in, we give another second and a half, making three seconds in all. Pushing it two-thirds in, we give another three seconds. So that the negative will be in three different sections, which have received one and a half, three, and six seconds respectively. This may help us when we come to compare the negatives

although in this case it is not actually necessary to give more than the single exposure to the plate, if we are sure what the correct exposure is.

The screen is then put on the lens and preparations made for exposing a second plate. The least increase we may assume to be twice, so that the first section of this will receive six seconds exposure. The shutter being pushed in a little way, we give another six seconds; then a little more and a third six, and the final strip receives twelve seconds more. So that the exposures on this plate will be six, twelve, eighteen, and thirty seconds, which are respectively two, four, six, and ten times the correct exposure without any screen at all.

In order that the results may not be confused by any difference in the degree of development, we put the two plates side by side in the same dish, and develop them together. It is quite possible to form a very good idea of the increase required, merely by noting the way in which the different strips appear under the influence of the developer: but we must not forget that we are dealing with yellow-sensitive plates, and any more exposure to the dark room light than is absolutely necessary is a thing to be avoided. It is better on the whole to curb our impatience, and to keep the dish covered as much as possible. When the correctly exposed strip on the unscreened exposure seems to be about correctly developed, the plates should be fixed, washed, and dried. They are then ready to be compared.

It will almost certainly happen that, when they are put side by side, one exposure on the one will be found practically identical in depth with that on the other: and when once this has been found, each to learn the effect which the screen is exercising. For example, we may find that the eighteen seconds with the screen is identical with the three seconds without it; when it is evident that the screen increases the exposure six times. If the eighteen seems a little too much, while the twelve is a little too little, it may be taken to be five times screen, and so on.

In making the comparison, an endeavor should be made to compare with the correctly exposed or central section of the negative made without the screen: as less dependence is to be placed on trials between incorrectly exposed sections. We must be careful also to compare depth of image—printing character—and not that very illusive and mileading quality, detail in the shadows

and misleading quality, detail in the shadows.

Should the range of increased exposures given to the plate exposed through the screen not be sufficiently extended to cover the actual increase which it entails; then the fact that on the unscreened negative we have a strip which has received one-half the correct exposure may be helpful. For instance, the strip which had ten times the normal, may only just match the strip on the unscreened negative which had half the normal, from which we may conclude that the screen calls for a twenty times increase. In such a case, however, a second series of tests should be made to confirm this, and to get a more accurate reading. As a matter of fact, commercial screens calling for more than ten times increase are not very often to be met with, but with home-made color-screens it is not unlikely that such a depth of tint may be obtained.—Amateur Photographer.

On the Unmounting and Re-mounting of Photographs

Perhaps next to the copying of faded originals one of the odd jobs which is most unwelcome to the photographer is the de-mounting of a miscellaneous lot of photographs and their remounting, as is most usually required, in an album. It need hardly be said that the work is of some delicacy, and it is just as well that its character should be made clear to the customer. Some people are quite ready to believe that the photographer can do anything which comes, however remotely within the sphere of his business, a compliment in its way, but one which is apt to react unfavorably should any accident occur. Therefore, as a means to some degree of protection it is good policy to explain that the removal of prints from their mounts is by no means a process unattended with risk to them, and on this understanding a customer who is not altogether unreasonable is ready to make allowances should any mishap occur to any of his

prints.

So far as the work of getting the prints off the mounts is concerned, it is necessary to bear in mind that mountants differ very considerably in the firmness of adhesion between print and board which they produce. The dextrine mountant which has been so largely employed for some years past will usually soften sufficiently to allow of the print being removed if the mounted print be laid between sheets of blotting paper, but in the case of a print on either gelatin or collodion print-out paper this is a procedure which involves considerable risk to the image. For reasons which are not very evident a print of this kind when thus treated will often fade to a considerable degree, and even in the case of bromide or gaslight prints or those by the carbon or platinum process (though the two latter to a lesser degree) there is the danger of damaging the surface. And then it is pretty certain that among a mis-cellaneous lot of prints which is brought for this description of treatment some at any rate will have been mounted with starch, an adhesive which forms the hardest cement between the print and the mount and one which no amount of soaking will soften in the least degree. On all these accounts, therefore, the safest course is not to damp the prints at all, but to work upon them in their dry condition, a method which is really a good deal easier than may appear at first sight. The procedure to be followed consists in shaving down the mount from the back or, rather, splitting layers off it with a thin knife, continuing this process until the mounting board has been reduced to the thinnest substance which can be attained in this way. Having reached this stage it will be found that the print can be separated from the thinned mount by laying it film-side down on a flat surface and, having detached the print at one corner, steadily bending the mount away from it by curving it (the mount) in an upward direction. From this description the process may seem, to those who have not tried it, a somewhat unpractical one, but a trial of it on a small scale will give an idea of the way in which it works. If one takes an envelope to which a postage stamp is firmly stuck and lays

it stamp-side down upon a smooth table and then, holding one corner of the stamp, pulls the envelope upward, at the same time bending it back, it will be found that usually the stamp will come away perfectly with a thin film of the envelope paper adhering to it. By operating upon the mounted print in the same way a little experience will show that the detachment of the print by this method is a fairly certain process. Should the print come away with portions of the mount of any appreciable thickness still adhering to it, these parts may be rubbed down with fine sandpaper until the print is of a uniform thinness

suitable for re-mounting.

In the work of re-mounting prints a strong adhesive is necessary inasmuch as they may often require to be handled without wetting, and the extra layer of mount which still adheres to them makes them somewhat stubborn as regards lying flat upon their new supports. A stiff dextrine mountant will suffice in many cases, but glue is a better adhesive, and is best applied by coating a thin layer of it upon a warm slab of glass or marble, then laying the print face upward upon it, and when it has picked up the glue placing it in position on the mount and well rubbing down. We have said nothing about the dry-mounting process, but, of course, prints which have been mounted by it may be easily taken off by heat in the usual way, or may often be readily detached by holding the print where it will get the strong heat of a stove or an open fire.—British Journal of Photography.

Knife Work on Bromides

The other day I was troubled with a number of black marks like very large pinholes in the emulsion of some small bromide enlargements. bromide paper was of a well-known and firstclass brand, and the trouble was no doubt due to war-time conditions; the point was how to get rid of the defects. Ordinary spotting was of no use, as the most prominent of the spots came in the high-lights of the picture, so another plan was tried. A very sharp-bladed penknife was taken, and the film very gently scraped away, the blade being kept almost in the true vertical position. A very few touches began to remove the worst of the trouble. The paper on which the prints were made was of the smooth platino-matt variety, and it was found that the little knifework hardly showed on the surface of the print at all; in fact, it could only be observed by the closest scrutiny, and though the part was left slightly lighter in tone, a few touches with a soft BB retouching pencil soon put matters right.

A lot of spotting has a very detrimental effect upon the surface of a print, or enlargement, and is not nearly as effective as the plan mentioned above. I afterward tried the same method on an enlargement with a semi-glossy surface, and found it in every way successful for lightening some over-assertive shadows. Two hints may be given. Have a very sharp knife, and a very light touch: It is best not to confine the scraping too much to the small area required, as in this case the finished result is apt to look patchy.—EXPERT in British Journal of Photography.

Some Essentials in the Fitting of the Dark Room

In the fitting up of fresh premises for a photographic business of moderate size many photographers, so we still find, experience a difficulty in breaking away from the old tradition according to which the dark room was often the smallest and the worst ventilated room which could be found in the place, and often provided exactly the conditions for the production of defects in plates and negatives which would be laid to the charge of the manufacturer. It is surprising that masters of studios should still expect work to be done well and cheerfully in places which are so ill adapted to the convenience and comfort of their assistants. A reasonable amount of space is one of the first essentials in a dark room; it is tiring to work in close quarters, for, apart from the bad effects of faulty ventilation, the constant necessity of moving and working with the care which is imposed by a confined space constitutes a strain upon the worker. On this account there is every good reason for having the dark room of ample size. It is then practicable to carry on work in one part under illumination which will not interfere with the handling of more sensitive materials in another part, while the freedom of a decent working space largely reduces the degree of fatigue consequent upon continuous hours'

employment in the dark room.

Apart from this general desideratum, one of the first essentials in the fitting up of a dark room is that on occasion it can be flooded with full daylight. Cleaning up after a batch of work and the regular cleaning which a dark room should have every week or so can only be satisfactorily done by daylight. Of the various methods for readily admitting daylight there is none better, in our experience, than a double blind running in a frame which is fixed right over that of the window, and which provides a trap for any light creeping round the edges of the blind. Messrs. Sinclair have specialized in the supply of a frame of this kind, and no more convenient form of it could be imagined, although no doubt the man who is handy with tools will find no difficulty in making a similar arrangement for himself. Two separate blinds are necessary, for the reason that no single thickness of material can be depended upon to be sufficiently free from pinholes as to ensure complete exclusion of light. In the Sinclair contrivance one of the blinds is of ruby material, but we think it is just as well to have both the blinds black, for in these days of the almost exclusive use of development papers, it is a mistake to rely on the varying strength of filtered daylight for the illumination of the dark room. Moreover, the fixed position of the window in a room, if the window is to be used as a source of ruby or orange illumination, greatly limits one in arranging the working benches in the most convenient way.

A point which, we think, comes next in importance is the provision of a sink of large size to take the tanks or dishes used for the fixing of negatives or prints. The sink should be of such size that plates or prints can be transferred from the fixing bath to the first wash water without removing them from the sink. According to this plan, the floor of the dark room will be kept free from

splashes of hypo, one of the most fertile causes of spots and markings on either description of sensitive material. If prints are handled at a different bench from that on which negatives are developed, then this also should be provided with its large sink in line with it for the accommodation of the print-fixing bath or baths. In the case of that for negatives, an essential fitting, in our judgment, is a lamp projecting slightly over the sink, and adapted for yielding diffused white light when it is required to examine negatives after fixing. This lamp may be of the very simplest description—a box having a front measuring about 12 by 20 inches, and fitted with a sheet of opal glass or a couple of thicknesses of ground glass. If electric light is used, its illumination is a very easy matter; while if gas is the illuminant, a Bijou inverted burner will give ample illumination, and may, in certain circumstances, to which we refer in a later paragraph, be placed outside the dark room. At any rate, let there be the facility for examining each negative, as it comes from the fixing bath, by transmitted light without there being the occasion to carry it to another place in the room or to the daylight outside, and in so doing to contaminate the floor with drippings of hypo solution. A drawback which certainly attaches to a large sink is the water which is bound to collect on the bottom of it, and which thus tends to make the room very damp. This may be got over by placing the sink slightly tilted toward the outlet, and providing it with a slightly angled false bottom in the shape of a grid, upon which dishes, etc., can be conveniently stood. This plan enables the sink to drain almost dry after use, while it does not interfere with the occasional employment of the sink for washing a large batch of prints, or even for the development and fixing of an enlargement of altogether unusual size, the usual plug for the outlet being replaced by one which permits an inch or two depth of water in the sink and allows any water above this depth to pass down the outlet. The wooden grid also obviates the liability to breakage of measures or dishes which may be accidentally let fall on an earthenware sink, while in the case of smaller sinks, which it may be considered satisfactory to set level, the same degree of prevention of breakage may be secured by the use of a mat of rubber or thin lead on the floor of the sink. One or other of these arrangements is, we think, preferable to the use of lead sinks, which are much more difficult to keep clean, and are not altogether free from trouble in the way of leakage.

In the fitting of benches at which the development of plates or prints is done, a large measure of comfort is secured by surfacing the bench with good thick first-quality lineleum, which will last for years, and is made perfectly clean after the day's work has been done by going over it with a cloth. It is not a bad plan to nail down a narrow fillet or beading of wood along the front and back edges of the bench, in order to prevent any developer or other solution which may be split from running down the sides. Another plan to the same end, which we have used ourselves and have noticed in dark rooms from time to time, is to make the top of the developing bench on a slant toward the sink which forms a continuation

of it. In order to provide a level top the bench is provided with a wooden grid, supported at the lower end of the bench—i. e., that next to the sink—with a cross bar which just brings the top level. Thus any solutions which are spilt drip through the grid and find their way down to the sink. A grid of this kind should be made of stout wooden slats fairly close together, that is to say, not more than half an inch apart, and it is well to give it two or three coats of linseed oil varnish in order to make it waterproof and impenetrable by the developing solutions. Shellac varnish is useless for this purpose, as it is attacked by the alkali of a developer, and then becomes soft and

sticky in places.

As regards the lighting of the dark room, the photographer who has electric current at his command naturally finds his task of providing the most comfortable and convenient illumination greatly simplified; but, whatever illuminant is used, the endeavor should be made to provide a working bench which is used for both negatives and prints with two separate lamps—one (for negatives) with the safelight in an upright position, so that the negative can be conveniently help up in front of it, and the other (for prints) with the safelight horizontal, so that a flood of the requisite illumination is thrown straight down upon the developing dish. With electric light, the horizontal type of lamp is, of course, quite easy to contrive; with gas, it requires a little ingenuity in fitting a box with a safelight between glasses and a short distance above it a compact form of inverted incandescent lamp. While we are upon this subject we may refer to the question of considering the design of a dark room in the first instance in reference to the compulsory use of gas as an illuminant. If it can be arranged, it is obviously of advantage to have the gas burners placed outside the dark room, and if a room of fair size is available, this may be most conveniently done by partitioning off a part of the room with match-boarding for the developing and other operations, arranging the developing bench, sink, etc., where light is chiefly required, along the length of the partition. The necessary gas burners can then be placed on the outside of the partition, and, if provided with by-passes, can be entirely controlled from within the dark room. This arrangement consumes some extra space, but as a rule the portion of the room outside the partition can be very well utilized for such miscellaneous operations as intensifying, clearing or reducing negatives as require to be done by white light.

There is only one other point to which reference may be made in these general notes, and that is the desirability of the dark room being without a door. In any business where several assistants require a work in the dark room, it is a considerable economy if entrance to and exit from it can be effected without admitting white light. While a pair of doors, one opening in one direction and the other in the other, with sufficient space for a person between the two, can serve for this purpose, it is a somewhat fallible method, since one can never guarantee that an assistant will close the first door before opening the second. Where the arrangement of premises permits it, a much more satisfactory plan is an open doorless zig-

zag entrance-way to the dark room, such as may be devised by a matchboard erection, with the inside surfaces of the entrance painted in dead black. This, again, is an arrangement which requires a fair amount of space to carry it out, but it is one which it is worth while to adopt, if circumstances permit, not only on account of the prevention of waste of time, but for the sake of the improved ventilation which the open passageway affords.—British Journal of Photography.

The Technic of Printing-out Papers

SUMMERTIME brings with it a number of troubles to the amateur photographer, not least among them being those which develop in printing-out papers during their various treatments. P. O. P. is by far the most delicate material used in photography, on account of the free silver nitrate contained in the film, which is anxious to combine with practically anything to form a chemical stain. The pores of the skin, especially in warm weather, contain a good deal of organic matter with which silver nitrate will readily combine, and this is the reason that finger marks are so frequently made on P. O. P. prints.

are so frequently made on P. O. P. prints.
P. O. P. is coated with a gelatin (or collodion) emulsion containing usually silver chloride and silver citrate—two insoluble silver compounds which darken on exposure to light—and in order that they may darken progressively, the free nitrate of silver is added in excess, the chloride and citrate, as they become reduced by the light, taking up what they require of this, to build up the image. Paper coated only with the chloride or citrate, i. e., without the free nitrate, would print out to a very weak, faint image, which would almost entirely disappear in the fixing bath; the excess of silver nitrate enables the printing to go on until a dense and substantial image is formed.

There is a preservative employed also in the emulsion—usually citric acid—and both this and the silver nitrate must be entirely washed out of the film before it is toned with a gold bath.

of the film before it is toned with a gold bath. In warm, damp weather P. O. P. is apt to deteriorate or discolor if kept long, unless suitably wrapped up, and it will be found a good investment to buy a few sheets of waxed paper, and to wrap up opened packets of P. O. P. in it and keep them in a dry room—the amateur's dark

room rarely being dry!

When using separate toning and fixing baths everything depends on getting rid of every trace of acid and of free silver nitrate previous to toning. The prints are often washed in running water or in several changes "until the water no longer becomes milky." This is not altogether a perfect criterion, since the same bulk of water will dissolve about 1.7 times as much silver nitrate as it will of citric acid, and the latter besides being thus less soluble is often present in greater quantities than the first-named substance. Fifteen minutes' careful preliminary washing is very desirable, and we then have a pure image of reduced silver salts to deal with in the toning bath.

Gold toning requires an alkaline solution, *i. e.*, the opposite of acid; ammonia, soda, etc., are alkalies, and gold baths are usually made with

alkaline salts, such as, for example, borax or sodium bicarbonate.

Hot weather increases the rate of toning, and a mote dilute bath than is usually recommended will give us greater control over the operation. A grain of gold chloride dissolved in a pint of distilled water, and rendered just alkaline with a very little bicarbonate of soda, will be found an admirable bath. A piece of red litmus paper should turn faintly blue when the solution has been rendered sufficiently alkaline with the soda.

The sulphocyanide bath is of course by a long way the most popular, two grains of gold chloride being usually dissolved in sixteen or twenty ounces of water with thirty grains of ammonia sulphocyanide. The latter should be first dissolved in distilled water (organic matter in tap water tends to decompose the gold chloride), and two drams of stock gold solution are then added. The stock gold solution is made by dissolving the contents of a fifteen grain tube of gold chloride in fifteen

drams of distilled water.

Beginners sometimes find that the prints refuse to tone; this may be (1) because they have used the same solution over and over again, and the gold has become exhausted, or (2) because the bath has become acid, probably through using it to tone prints from which the citric acid has not been entirely washed out. In the latter case a few drops of ammonia may be added to the solution; in the former case, fresh solution must, of course, be employed. Two and a quarter quarterplate prints have roughly the same area as one half-print, and one grain of gold chloride should, on an average, tone eight half-plate prints. It is far better to wait until you have several prints and to tone them at once, measuring out just sufficient toning bath for the lot, and throwing it away afterward, than to deal with separate prints. In this way troubles will be minimized.

The use of an exhausted toning bath is usually the cause of double tones, the gold being present in sufficient quantity to tone the faint parts of the image, but insufficient to complete the tone in the shadows; such prints may appear superficially well toned until they are transferred to the fixing bath, when the double tones become

apparent.

An important question now arises—Shall the prints be washed between toning and fixing? It is certainly a good plan to rinse them in three or four changes of water, otherwise the transference to the fixing bath of an appreciable amount of gold is inevitable, and if the same hypo solution be used for several batches of prints, it will end up by becoming a modified kind of combined toning and fixing bath!

If you are aiming at warm tones, and want to arrest toning when a certain color has been reached, it will be found an excellent plan to give the print one quick rinse in water and then

immerse it in a solution of

Common salt $\frac{1}{2}$ oz. Water 1 pint

Leave it here for two or three minutes, then rinse it again, and place it in the fixing bath. The fixing solution need never be stronger than two ounces of hypo to the pint of water, but prints should always be fixed for at least ten minutes. Imperfect fixing is undoubtedly a more frequent cause of faded prints than insufficient washing.

In very warm weather there is often a tendency for the film to become so soft that the least touch will cause abrasion, and handling of the prints is very difficult. An alum bath will overcome this trouble, but it should not be used unless absolutely necessary; it will, however, render the film thoroughly hard, and do away with any tendency to blisters. It may be made up a follows:

Potash	alu	m			$1\frac{1}{2}$ oz.
Water					20 oz.

The prints may be left for five minutes in this bath, and then thoroughly well rinsed before toning.

A few words may be said in conclusion about the combined toning and fixing bath, to which, especially in the hot weather, amateurs are liable to turn in order to avoid toning troubles.

The chief drawback to a bath which is obviously ideal from the point of view of simplicity and directness, is the tendency of the citric acid in the P. O. P. film to form sulphuretted hydrogen by acting on the hypo, which in turn decomposes the image by producing silver sulphide stains. Lead salts largely obviate this by combining themselves with the sulphuretted hydrogen, and thus preventing it acting upon the silver. The following is a reliable formula:

Distilled water				20 oz.
Нуро				7 oz.
Lead acetate				10 gr.
Gold chloride				4 gr.
Powdered chalk	ζ.			$\frac{1}{2}$ OZ.

Mix up in the order given, shake up well occasionally, allow to stand overnight, and then either decant the clear solution or filter it.

The prints are, of course, put into this bath without any preliminary washing, but they must be washed very thoroughly afterwards.—*Amateur Photographer*.

The Influence of Good Negatives

It is generally understood that the quality of a print depends upon the materials used in its production and the workmanship employed, but before tank development and bromide paper were so popular the quality of the negative was

considered of primary importance.

The easing of plate development by the introduction of the tank and the versatility of bromide and other development papers have brought about a tendency to consider negative making as of less importance than it used to be. Compared with old methods it is very easy to tank a batch of Rembrandts, or a batch of white backgrounds, or a batch of copies with the confidence of producing twelve decent negatives out of every dozen without any very special care, but, alas! it is just a trifle easier to let the three varieties get mixed, to make up the solution without regard for accurate strength, and to judge the temperature with a finger or not at all. If the consequent negatives are dense or thin, harsh or flat, there is a fatal temptation to remember that bromide paper will cover the fault. A competent bromide printer can certainly make passable prints off almost any negative, but at the same time an apprentice can make better prints from a perfect negative than the cleverest man can from an impossible one, and in much less time.

Some years ago I was asked to undertake the development of a large quantity of exposed plates most of them large-sized life studies, some direct and some copied. It was impressed on me that the negatives must be *fool proof*. Very large numbers of bromide prints were to be made from them by junior labor, in the shape of girl assistants who could "print" in the barest sense of the word only. A quantity of the pictures were of the white background variety, and I was told that no negative was to need vignetting, dodging, over- or under-exposing to give a good print, and that they were to be of a density which would not necessitate extreme exposures or changing of lamps

The production of those negatives entailed some care, but I am convinced that the trouble was not wasted, for had they been done in a slipshod manner an expert would have been necessary to print them and a greater amount of waste would have been incurred, for (and this is the point of the argument) though the right man can make good prints from all sorts of negatives, he cannot do it without an amount of "messing about" that may come expensive in the end. This covering up of poor negatives not only causes needless waste, it has its bad effect on the The forced prodigality with paper, printer. developer, and light induces extravagance in the most economical workers, while the thought that his careful work is encouraging the scamping of the plate development is likely to turn a conscientious printer into a "don't care.

On the other hand, perfect negatives encourage good work and economy, for with them it is not necessary to spend time dodging and faking or to use paper in numerous tests or to oxidize pints of developer in "forcing." There is, of course, a question as to what constitutes a perfect negative, and it is only likely that opinions differ on the point, but from a printing point of view a perfect negative is the kind of negative that can be found among the old boxes of almost any first or middle class firm, a negative that can be printed in platinum or P. O. P., and at the same time will give a good print on any good make of bromide. This latter is an important point, for many poor negatives will print on some par-ticular brand of paper easily, owing to a peculiarity of the paper. The perfect printing negative does not require any special make or any special genius to give a good print, and such a negative can be produced without any special talent or trouble if the important details of tank development are not neglected. I am, of course, taking it for granted that the subject and the background are correctly lighted, for, if not, that omission alone may spoil the negative for the printer.— British Journal of Photography.

Toning by Redevelopment

H. CAZNEAUX recommends the following formulæ for the production of rich warm-black, blue-black, and other tones, which are not of the

great warmth given by sulphide toning, but are nevertheless of service in obtaining prints superior in quality to those produced by direct development.

For a blue-black tone, with rich shadow gradations, on Austral cream crayon bromide resembling an etching, commerce with

Bleacher No. 1

Copper sulphate			240 gr.
Sulphuric acid (pure))		20 min
Sodium chloride .			240 gr.
Water, to make			10 oz.

The enlargement, which has been previously washed thoroughly and dried, is soaked for five minutes in clean water, then placed in a clean dish, and No. 1 bleacher applied. The bromide image quickly bleaches out, and the print is then washed for at least ten minutes in running water. A quick way for eliminating the surplus copper salts is to wash the print for a minute or two, and apply a 5 per cent. solution of nitric acid, and wash again for a few minutes.

The print is now in a state to re-develop, for which we have a choice of metol or amidol. Metol has a tendency to blister the papers in hot weather.

Metol			45 gr.
Sulphite of soda			160 gr.
Carbonate of sod	a		270 gr.
Water, up to			10 oz.
	or		
Amidol			25 gr.
Sulphite of soda			240 gr.
Water up to			10.07

Now re-develop the bleached-out print in full daylight, and wash for ten minutes. An alum bath can be used should the metol developer cause blisters. Rinse the print after development, and immerse in a solution of alum. Wash as usual.

For all re-developers omit potassium bromide. For warm-black tones—engraving effect—on "Austral" cream crayon papers use

Bleacher No. 2

Potassium permanganate	3 gr.
Sulphuric acid	2 min.
Sodium chloride	15 gr.
Water, to make	5 oz.

This is, perhaps, the most difficult method, but the warm-black tone is very fine. The print assumes a reddish-pink tinge while bleaching. Wash for ten to fifteen minutes, and re-develop in a powerful actinic daylight. Wash for ten minutes. Use the metol developer for this formula, and it must be fresh for each print.

For fine black color, platinum effect, use

Bleacher No. 3

Potassium bichro	om	ate		90 gr.
Sulphuric acid				250 min
Sodium chloride				1 oz.
Water, up to .				10 oz.

Wash the bleached print free of chrome stain—about fifteen minutes—and re-develop with metol or amidol in full daylight. Wash as usual.

For another fine black platinum color Bleacher No. 4

Potassium bichromate . . 100 gr. Hydrochloric acid . . . 200 min. Water, to 10 oz. Wash print and re-develop with amidol.

In the case of a light print which it is wished to intensify use the above bleacher, but reduce the hydrochloric acid by half. This becomes the well-known chromium intensifier. The color on bromide papers is very fine. "Tabloid" chromium intensifier is good for this purpose.

Failures in Sulphide Toning

ONE of the most fertile causes of failure in sulphide toning, beyond a doubt, is the deterioration of the sulphide solution. It is unfortunate that none of the sulphides which are in general use for toning are stable compounds, and from the moment when they are made they begin to decompose. In the case of sodium sulphide the rate of decomposition is governed to a great extent by the strength of the solution; a very strong solution will keep in good working order for months, whereas a very weak one, such, for example, as the diluted solution as used for the actual toning, will become useless in a few hours. The same applies more or less to potassium sulphide and to ammonium sulphide; but of the three the ammonium sulphide keeps in good working condition longest.

In any case, the knowledge that these sulphide compounds do gradually decompose when in solution should act as a warning to the photographer not to make up a larger quantity of the strong stock solution than he can see a reasonable chance of using, say, in a few weeks at the longest, and to see that that solution is a strong one.

It would be no very great inconvenience if the result of this decomposition were merely to make the sulphide solution useless, as if we found that it was not acting, we could then pour it away and mix up some fresh. Unfortunately this gradual weakening is not all that happens.

The result of decomposition is the formation of hypo, or its equivalent, and when a solution containing hypo is applied to the bleached print, the immediate result of such application is that the hypo starts to dissolve out the image, acting especially on the more delicate half-tones. Nothing that can then be done to the print will restore it.

This decomposition of the sulphide solution shows itself in two ways. When it has not gone very far the bleached prints are darkened by the sulphide, but the color instead of being a deep rich brown is a meager yellowish-brown. There may be subjects which such a tone would suit, but we do not know them: the result is, in our experience, invariably crude and unpleasant. If the decomposition of the solution has gone

further, the print may only darken a very little, the lighter tones not being visibly altered at all; while if it has gone still further, there will be no darkening. The bleached image, instead of being converted into a fully visible one of silver sulphide, is merely dissolved out. It is worth noting that this may happen even when the sulphide solution contains enough sulphuretted hydrogen to give it the characteristic odor.

Of course, no sulphide solution should be kept until it gets to this stage, and if there is the slightest doubt about its condition, it is best to throw it away. A simple test to see if it is in working order is to add a drop or two to a hypo bath which has been used for fixing. It should give a deep brown-black precipitate at once. If the fixing bath does not contain dissolved silver, that is to say if it has not been used, there will be no precipitate, whether the sulphide is in good condition or not. If the color of the toned print is unsatisfactory, the first thing to look to is the condition of the sulphide solution.

It is not likely that the bleaching solution will give any trouble. The most popular bleacher is one which consists of a mixture of potassium bromide and potassium ferricyanide, and as long as enough of both is present the actual proportions or quantities of the two ingredients will only affect the rate at which the bleaching takes place.

Theory indicates that the ferricyanide should be a little in excess; if it is not, the solution will cease to act before the whole of the bromide in it has been used up. But that is the worst that can happen. Of course, hypo must not find its way into the bleaching bath, since as this contains ferricyanide it will form a reducer.

This points to another possible cause of bad color in toned prints, and that is the application of a bleaching solution of ferricyanide and bromide to a print which has not been thoroughly washed after fixing. The effect of any hypo will not be seen at the time. The print will appear to bleach just as if all were going well. But some of the image will not only be bleached but dissolved out, and the final result will not be unlike that which is obtained when a partly decomposed sulphide solution is used.

One more possible, and indeed frequent, source of poor results is to be found in the attempt to tone prints which are not suitable. A thin delicate picture in black may give a thin delicate result when toned, but only if the delicacy in the first place has not been got at the expense of complete development. There are dodges which photographers use in the development of enlargements to get pictures in a high key, or to get other special effects, but it is a characteristic of sulphide toning that it is not applicable to such results, at least not successfully. The extra minute or two in the developer, which if the paper has been correctly exposed does not have any visible effect upon the image, is an essential if we are to sulphide-tone afterward.—J. H. R., in *Photography*.

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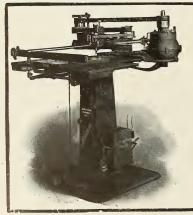


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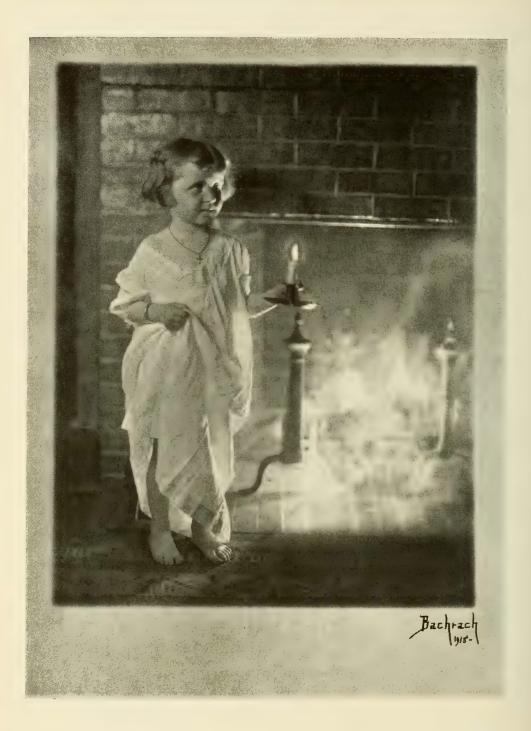
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CONCERNING COLOR VALUES

By "PROFESSIONAL"

A PROPER understanding of color value is most essential for the professional photographer. A medium or even very low-toned photograph, showing the face and hands tinted to a greater or lesser degree, must not off-hand be classed as one possessing great color values. It is not enough that the features, etc., be simply interpreted like white paper but with a lesser degree.

This is only a superficial view of the matter. A "low-toned" face and hands may give color, and on the whole be very fair, but still missing in the values of color. There is a distinction here; analysis only will determine whether the values are quite correct, only fair, or positively bad. Therefore, in examining work of your own or the production of others, educate yourself by continually analyzing all work that comes before you.

A Good Definition of Color Values

"Hold your open hand before you, partially close your eyes, and look, not

for the outline or shape of the hand, but for the patches of light and shade: You will see that the palm, which is directly before you, has the lightest light upon it, and that there is a gradation of light into shadow in the spaces between the fingers and around the ball of the thumb and the sides of the hand where they lead to the edges. These gradations of light and shade, which necessarily involve gradations of flesh color and possibly the reflections from side lights, are values. Look closely at the face of a friend, a young lady for instance, and you will see highlights on the nose, cheekbones, forehead, and chin. The side of the nose is slightly in shadow, which runs up into the highlight again as the cheek is reached, and then the shadows begin once more to deepen as your eye follows around toward the ear. Under the chin and around the throat are still deeper cast in shadow, and if Rembrandt was painting the picture the lines of the neck at the side would be almost lost in darkness.

"Look at her red jacket, and note the

(527)

shadows in the folds of the sleeves at the elbow. Look closely, for the shadow does not make blackness but only a depth of red. These again are values."

Values Influenced by Atmosphere

To quote again from the same au-

thority.

"Two people dressed exactly alike—policemen, for instance—one at twenty feet away and the other at a distance of one hundred feet: The first one appears stronger in color than the one farther away, which is produced by atmosphere and reflections from surrounding objects. These effects are also called values.

"It will be understood, then, that by the art term of values is meant the variations of light, the effect of intervening atmosphere, and the reflections of surrounding objects or colors, all combined.

"Properly speaking, values are nothing more or less than the relations of light and shade. The word is generally used to signify the complicated, instead of the simple relations of light and shade. For the sake of simplicity it is best to consider it in the popular sense as something sufficiently different to be known by its own name of 'values.'

"You had better consider values as being the changes wrought in color or light by surrounding colors, objects, or

atmosphere.

"The workings of these various modifiers may be illustrated by taking, as an example, the full-face portrait of a young woman. In order to give the face and figure relief, chiaroscuro (or light and shade) in its simplest form is used. The nose, cheeks, chin, and forehead are high in light, and the back parts of the head and neck are graded away into the shadows of the background. These gradations are, in the second place, qualified by the flesh colors of the face, which are likewise graded in a descending scale proportionate to the quantity of light they receive. Thirdly, if the lady be represented at the end of a long room or gallery, instead of close to view upon a neutral ground, the elements of atmosphere will enter and change the appearance of the whole. Fourthly, the appearance of the face will be changed again if a hat be placed upon the head; the brim, extending out over the face, would throw the forehead and eyes in shadow. The shadow would be influenced by the flesh tints, and the face would take the coloring from the reflections of the red felt hat, if such were worn.

"Generally speaking, the absence of the values from a picture can be noted not only by the lack of shadow gradations, but by the unreal appearance of

the whole piece.'

The above quotations from John C. Van Dyke, which we think are well worthy of several readings, are cited even at the risk of bewildering or befuddling the brain, for the purpose of impressing upon the reader a fairly comprehensive idea of the complications that enter into the subject of values, and for the reason that he may appreciate to some extent the scope of this art principle. His analysis of pictures will thus be founded upon a proper understanding of conditions.

In our own practice as photographers we must needs rely for our means of expression upon the plate and paper used, and therefore many of the complications of light that beset the artist in his treatment of atmosphere, reflected lights, etc., are more or less mechanically produced for us in monochrome. Very subtle or more positive reflected lights, which are the cause of such anxiety to him in his consideration of values, are produced for us in value in exact proportion to the degree of accuracy obtainable in the chemistry of our process, aided somewhat perhaps by other means that we may bring to our assistance.

This simplifies matters and it is well that it is so, else the task be too great, yet there is enough in it to demand our

earnest consideration.

That photographer to whom reference was made as admiring above all else technic in photography, who has made a life study of preserving the modeling of the face in the lighting, dark-room manipulations, etc., who is accustomed to watch his work closely with this end in view, and who insists that it be done, is very near, indeed, to obtaining "values."

If, in combination with this, he affects negatives that are tolerably thin and delicate, or even very thin if of good printing color, then he is nearer still to obtaining "values." If he goes further, and poses his subjects in the light-room at that requisite distance from or in the right relation to the source of light, color is imparted to the faces and the whole arrangement thrown into proper tone, then the photographer is producing both "color" and its "value." The work of this man ranks very high, both with his brother photographers and the artists alike, and his clientele will be from that class of the public which appreciates artistic work and is best able to pay for it. Such a man can very easily acquire all principles in art applicable to photography. This technic makes him a master in accomplishing what he desires. Possibly his greatest difficulty lies in breadth of treatment, but even this he may adjust by careful study.

Color Values Should Indicate Distances

Color values should denote relative distances in the face as well as the drapery, one as much as the other. gradations of light and shade should show the nose, forehead, chin, cheekbone, and the ear in their relative positions as regards the distances that these features are from each other. should be done without forcing forward the front part of the face by undue amount of light. The ear is the most unruly member of the lot. Standing out in many instances from the ground, on account of its isolated position and its readiness to catch an undue amount of light, it is very likely in the negative to appear too far in front of its proper position. Turn the picture upside down and look at it this way. As you will not then be so confused by seeing the face in detail, the ear will appear more as a mass or spot, and its relative position to the planes of the face will be more readily determined. Use a side banner a foot wide on a stick that raises and lowers, or screen by the system of side curtains, to cut off in a great measure the light falling upon the light ear, without interfering with the light on the face. This throws back the ear in shadow. Many of our best workers produce values on the face

in a graduated scale by the use of some such device. When used, the screen should be of dark opaque cloth, rather than yellow or orange, which is liable to flatten the whole lighting. This latter is deceptive, the whole face frequently acquiring a yellow or orange light, often unnoticed or its importance unappreciated until after development.

The above remarks as to the distances of the planes of the face from each other, apply with equal truth to the drapery. Think them over carefully.

Color Values in Light or White Masses

Some of the most noticeable instances in which attainment or absence of values in paintings and photographs make themselves apparent, are in large or smaller masses of light, such as, for example, white collars, shirt waists, ribbons, laces, white dresses, etc. When well done, the pictures always catch the audience, as will the well-worked-up climax in the drama.

This appreciation of values in white drapery is one of the most easily acquired principles in art that the educated public absorbs. It is therefore safe to assume that as a class they are able to render good judgment in this respect, even if their views are more or less befogged on other things.

The writer often commented upon the many shades of value it is possible to obtain in a carefully lighted dress without the loss of quality. By this we mean, without that white dress appearing as if it were gray, and deepening to a black, often the case when overdone.

The writer accepts without question the consensus of opinion of many artists, that no white in dresses, etc., in a picture, painting or photograph, should be as white as a pure white cardboard would be when placed beside it for comparison. Upon a shade somewhat darker than the cardboard, is based the strength of the lightest white, and from this in a descending scale are graduated the other values. As these different parts of the drapery recede from the source of light, in some such proportion should the strength or purity of the white diminish, being controlled, of course, by the curva-

ture of the body, its location, and by the reflections.

As the clothing that fits the figure never presents a flat plane of any size without some change (being totally different from the flat surface of a sheet of glass, for instance), anything that would show a proportionately large area of the same value of white would be naturally incorrect. Their values, therefore, should, under ordinary conditions of good lighting, follow each other in sequence all through the figure, adding interest and beauty to the whole picture. This is not a case for "doctoring" the negative, the work is far too delicate for this method of correction. It is purely a matter of careful lighting and exposure, and delicate handling in development. Do not choke up your white draperies with strong, quick-acting developers. Reduce your *normal* developer with water and work for delicate effects.

Proper lighting does the work, which straight developing (without bromide)

brings out.

Of course, it is admitted, without argument, that we can make things less bad at times by the reducer and other means, but the smartest man in the country cannot restore with perfection in any way comparable to the proper production in the first place.

In closing this topic the writer would

urge the following points:

1. In lighting strive for low-tone pictures to that extent only that will properly represent to your mind the complexion of your sitter. Use only the

lowest effects for the deepest or darkest complexions. Do not portray a fair child or young lady with the complexion of a Hindoo.

2. Use largest stops or open lenses. In the latter case, have the aperture covered with a black velvet band that slips over the barrel when the stop is removed.

3. Avoid extreme, fuzzy effects; often very harmful, with loss of texture and values. They cause distortion, except when employed by those comparatively few who know what they are about.

4. Try to improve your pure photographic technic, so that you can obtain the results you desire. When you have learned enough of this, pose as a *good photographer*, and devote the balance of your attention to other things. Do not make this perfection of technic your ultimate aim if you desire pictorial work especially. Many photographers would do more artistic work if they knew less of it. A lover of technic often overdoes matters by access of interest in technic and omissions of other attributes.

5. Study the subject of values. Study good pictures. Preserve quality, so that when you are photographing white, gray, or black, you will obtain the luminosity of these colors in their respective values, not making something different, unless—and this is important—you intelligently arrange lighting, etc., so as to clearly explain the reason for the change.

6. Use common sense in all low-toned

work.

Next month I shall treat of color tone and "atmosphere."

THESE THINGS SHALL BE!

A loftier race
Than e'er the world hath known shall rise
With flame of freedom in their souls
And light of knowledge in their eyes,
They shall be gentle, brave, and strong
To spill no drop of blood, but dare
All that may plant man's lordship firm
On earth and fire, and sea and air.
Nation with nation, land with land,
Unharmed shall live as comrades free:
In every heart and brain shall throb
The pulse of one fraternity.

GETTING MORE BUSINESS

V. GIVING YOUR WORK DISTINCTION

By J. CLYDE WILSON

THE late Elbert Hubbard said that there were two ways of withstanding competition: one was by making a better article than was commonly offered the trade and selling it at a better price; the other was by making an article of equal quality at a lower price than any one else could make it and by so doing command a volume of trade. Ford has capitalized the last method with a result that puts its truth beyond cavil. Of instances in which quality has brought success we have many more examples, for superiority is naturally a chief selling argument and is more widely used than any other.

There are more reasons than one why photography as a business is best exploited by capitalizing quality. You will recall exceptions in which a large and profitable business has been built up on the contrasting principle cited above—by commanding a volume of trade by low prices—but a business of this kind is limited of necessity to a class, because it is not possible to produce very satisfactory results unfailingly when the selling price of the pictures is so low as to limit the number of plates to be used at a sitting rigidly, the time to be spent upon retouching, and so forth. The public, taken by and large, does not buy photographs on a price basis so much as it does through the promise of excellence indicated by examples of work it has seen. It buys where it believes it will get the best results at a price it can afford to pay—but that is not usually the lowest price at which pictures can be bought.

The highest grade of photographic work made by our professional photographers is remarkable for its individuality. So distinctive is some of this—the work of some of our best-known photographers hardly needs a signature to be distinguished. To walk up Fifth Avenue, New York, and peer into the display cases of some of our well-known photographers whose work is displayed there, is a constant revelation to the out-oftown photographer, for it is an excursion full of surprises. Each man there stands on his own feet, and his work has a characteristic excellence of its own different in kind from that of his neighbors. What is true of the work of the photographers on this aristocrat of thoroughfares is largely true of the work of the leading photographers in the large cities through-

out the country.

But most of us are not Fifth Avenue photographers. Indeed, those who supply the larger rank and file of the populace with photographs, the greatest number of photographers, are those who do work of a very high order, excellent in tones, composition, and technical quality -what we are inclined to call bread-andbutter photography. The only trouble with this kind of photography, as a business, is that it is the most crowded. The kind of work done is too good to escape competition on a price basis, but it is not different enough, the individual photographer's work, to stand out from the mass and create attention. It lacks distinction. If you will just walk around any fair-sized city and peer into the display windows of the photographers who make their living there you will appreciate this fact. There is a sameness about the work. There are the usual poses and the ordinary lightings, the mountings are the customary commercial mounts sold at so much per hundred. The work is in sepia or it is in black. Each picture contains its full scale of tones, or at least there is an endeavor to secure themwhereas some of the most unusual pictures are made in two tones, such as delicate effects in gray and white, set off by the color of the mount. Often attentionvalue is secured by abrupt contrasts, by juxtaposition of light and dark masses, by direction of line, and composition.

Carlyle said that genius was an infinite capacity for taking pains. It is evident,

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in carefully studying works of art, that this is so. The artist seeks to convey an impression; to interest the spectator as he was interested by the subject pictured. He seeks to find out what it was that especially interested him and then to exaggerate that feature or by some other means give it emphasis so that it When you walk will be impressive. through a wooded road, shaded by high bending elms, you are much impressed, and nine times out of ten you will compare the effect to the vaulted ceiling observed in some towering cathedral. The arching trees and the vertical lines of their trunks give an exaggerated effect of height that stirs one. If you were picturing that scene, you would seek to emphasize these vertical lines. That is what made the place impressive—by missing that fact your picture might be a failure and you would wonder why.

So it is in taking portraits: to make one's work distinctive it must be expressive. Very frequently we see small children photographed against black backgrounds. The photographer's aim is to secure contrast and make the white garments of the child stand out in contrast against the dark background. It surely will result in that way—but the picture is not as impressive as was expected, because nothing is less characteristic of childhood than contrasts. Whether it is as joyful a time to the infant as it is to the grown-ups about him, we think of childhood as the one period of life that is unclouded—a time of constant joy: and nothing is so typical of joy as light. That is to say, as a rule, children should be photographed with light backgrounds. This is cited by way of example. On the other hand, darkness in contrast with light will very effectively express rugged character of the kind that has known sunshine as well as shadow. The stronger the character the less diffused need be the light and the less delicate the shadings. On the other hand, feminine beauty is very frequently defined not merely by graceful line but as often by delicate tone. The diffused-focus lens, delicate gray background, and entire absence of black in the picture will secure the effect desired.

The bane of professional photography

has been the painted background. Nothing could possibly make a picture more artificial than this unlifelike and lazy means of securing effect. That is not saying that it is not possible to use tapestry backgrounds or wall-papered screens to secure effective results. The trouble with the painted background is that it is not flexible in the artist's hands. Its staid design must be duplicated in every picture in which it is used, and the result is the commonplace, ineffective photography that has too long held sway in the profession. Better to use plain drapes or unpainted screens of gray, white, and black than these stereotyped painted screens.

Working in your own background in each negative does not take long and isn't very hard. Even with little skill one can break up a plain effect and secure variety to the enhancement of his work. A method not often described is this: Take a tube of indigo blue oil color (it is presumed every photographer keeps a little indigo blue on hand for dodging deep shadows in negatives) and squeeze a little on a saucer. Spread it out and with one finger begin to pad it on to the back of the negative. It need not be put on thick; in fact, when carefully padded out to evenness, it should be transparent. The whole of the negative need not be covered. If the draperies in the subject are in too deep shadow, but detail is evident, these parts of the figure may be padded over like the background, but customarily the figure is not covered. Nor is the blue evenly spread on the back of the negative to its very edges. On the contrary, it is well to take a good-sized tuft of cotton and with a sweeping motion lightly brush the paint from the negative, toward the margins, grading it off carefully. This is not hard to do at all. This done, a toothpick should be used, the pointed end covered with a small bit of batten, to wipe away any blue that may cover the figure, carefully following its outline. This done, one may wipe out some of the paint from the edges of the background to make silhouettes of trees or foliage. A little experiment is necessary to do this successfully, but it is a very flexible method, and one who has become handy at it can

make any kind of background effect, in harmony with the picture, in five or ten minutes at the outside—an investment that will enhance the value of the photographs by several dollars. The picture itself can be taken against gray or black backgrounds or any intermediate shade. Where very pale gray screens are used the effect is unusual and decidedly

charming. There is great opportunity for originality in the mounting and finishing of photographs. There is often danger here of offending good taste by going too far and employing the bizarre. For example, the use of color unless well done is certain to mar a good picture. Putting a flat tint of flesh color on a face is a common device of cheap photographers and it is a poor one. On the other hand, a wellknown Los Angeles photographer a few vears ago scored a business scoop, so to speak, by using an etched effect, done by an artist of consummate skill, that made his work imitated all over the country. The distinctiveness of the effect and the skill with which it was done doubled his business in a short time. It takes taste and imagination to create individual effects of this kind, but it pays. There are untold opportunities for original work where white backgrounds are employed. A photographer, a few years ago, had the happy good fortune to draw two right angles in pencil, one about one-eighth of an inch within the other, in the upper left hand corner of his vignetted pictures. It added just the necessary variety to break up the great expanse of white

The motion-picture photographers are constantly offering suggestions in the way of poses and lighting to the "still" photographer. There is the silhouette lighting, which is old and still is new. In the days of Sarony it was much in favor, used in a rather stereotyped and

background, and, because no one else had

thought of it before, made his work seem

different and more desirable.

formal way, and termed, we believe, the "Hetherington" lighting. How seldom it is seen today, effective as it is. Pirie MacDonald was one of the first photographers to see the immense opportunity found in the use of two sources of light. He has had recourse to its aid for years in delineating men. John W. Alexander, the well-known artist, recently deceased, offered an unusual tip in his work as to the effectiveness of line, space, and curves in particular. One photographer has made capital use of this to his profit, for, starting in a small Ohio town, his studio is now found among that amazing row of photographic artists who have risked their fortunes by venturing a career on Fifth Avenue.

Nor does distinction end with the composition and finish of a picture. Even the care with which it is wrapped tells. Tissue paper is inexpensive, but things carefully enclosed in tissue are handled with care; it is a mark of worth, just as the plush-lined box of the jeweler gives his wares more worth than they would have if delivered stuck through a card and wrapped in brown paper. Use a fine grade of wrapping paper—white if possible, or even a cardboard box if the prices you can get will warrant. These are details, but it is good business to give more than passing heed to them. In selling pictures it is hard to say where art should end and business begin. We are inclined to think that it is the impression of an artist's capability and taste that sells his work. No stone can well be left unturned that will help aid in spreading broadcast the general opinion that your work is of this kind and merits public confidence.

You will find it will pay to make your work distinctive—to make it stand out from the mass by some characteristic of its own. It is this difference people will pay an increased price for. It cannot be purchased elsewhere and must be bought of you at your own terms.

(To be continued.)

Each Christmas makes idealism and realism one, the the story is so familiar we scarce apprehend the fact at the back of it.

ST. LOE STRACHEY.

MOUNTING AND FRAMING PHOTOGRAPHS

By JAMES SPENCER GORDON

T is pleasant to note that those who announce prize competitions lately make the condition that the pictures submitted must be artistically mounted. Usually, to judge from the work that is to be seen at local exhibitions and elsewhere, a great many photographers are still hardly alive to the extent to which the mount can modify the appearance of the print. In order to study this there are a very few simple experiments which may be performed with one or two prints and some of the plain mounting papers which are at present so largely used; and these experiments, by demonstrating to the eyes things which otherwise one may only hear or read about, will impress on the mind the facts which they illustrate in a way nothing else can do.

One of the factors which play so large a part in the influence of the mount is contrast. An experiment which anyone can try in a moment will illustrate this in a striking manner. If little squares of red or blue paper are cut out and laid on papers of other colors it can be seen how very different the colors look when their surroundings are different. Although we know the colors to be identical, the individual squares being cut out of the same sheet, it is very difficult to believe that this is so, their appearance is altered so

Rough papers are used in photography, not because there is any beauty or charm in the roughness itself, but as a means of hiding detail that is not required and so helping to secure breadth of effect. It follows that, so long as this advantage of the rough surface can be secured, anything that tends to attract attention to the roughness should be avoided. For this reason the texture of the mount on which a rough print is shown should itself be rough, or at least not so smooth as to emphasize the roughness of the print by contrast.

Another way to obtain a good effect is to take a piece of gray paper, not very light nor very dark, together with a sheet of white and a sheet of very dark paper. In the white and in the dark paper an opening about the size of a postage stamp is cut, and the two sheets are laid on the gray paper so that a portion of the latter can be seen through the opening in each. Anyone who has never tried this little experiment on the effect of contrast will be very much surprised at the result. The gray paper seen through the opening in the white paper looks very much darker than it really is. on account of the contrast with the white. For exactly the same reason, the gray seen through the opening in the dark paper looks very much lighter than it is. It is hard to realize at first that the two patches of gray are actually identical in depth, contrast with their surroundings has made them appear so different.

Another experiment by which the same thing can be demonstrated is to arrange three or four pieces of paper, each darker than the last, so that they overlap, much as they are shown in the sample books of mounting papers. Each strip that is seen, except the end ones, is shown one edge against a paper that is lighter and the other edge against a darker paper. The former edge, therefore, by contrast appears darker, and the latter edge lighter than it really is and each strip of paper seems to be graduated from one side to the other.

On the gray mount the picture may not appear in any way too flat, whereas on the mounts with strong contrasts it will look altogether too weak. Although it might be gathered from this that a print that is already too strong in its contrasts may be made to appear flatter by being put on a mount which itself is strong in contrasts, such a course is not to be recommended, at least to any but a very mild extent, as there are reasons why strong contrasts in a mount should be avoided as much as possible. Contrast itself may be emphasized by contrast. This can be seen very easily by choosing a delicate, soft print, cutting it in half, and putting one half on a gray mount neither very light nor very

much.

dark, and the other half on a mount in which there are strong contrasts, such as a dark gray with white lines or a very

light mount with black lines.

Many errors of judgment are made in selecting white mounts. For instance, many of our artists in modern portraitphotography are fond of imitating the Rembrandt lighting. Thus we see a girl's head, partly lighted, with strongly lighted shoulders coming out of a deep shadow, the whole surrounded by a glaring white mount. This creates sometimes the impression of an overprinted photograph, and the figure represented appears altogether too dark; for the white margins not only diminish the effectiveness of the high-lights, but render the flesh tones, which are half shaded. unnatural and gloomy. A dark mount (dark margins), on the other hand, increases the light values of the picture and enhances the intended artistic effect. We should, however, not generalize this, for one ought not to exclude bright borders (margins) on principle. As an example, a tender female face would appear on a dark mount still more feeble, whereas the effect on a mount with bright borders would be darker and more forceful.

Most pictures are not framed, but put in albums or boxes, yet the best samples produced by amateurs as well as professionals are framed and a few data may not be amiss. The simpler the frame the more conspicuous will be the picture. The moulding may be wide but should not be too deep. It is just the flatness of the frame by which the depth of the picture is increased. One should choose dull, mat frames, not polished ones, in order to render the tone of the print full and bright. We often see brown, lowtones portraits, the dark portions of which are unfortunately overshadowed by heavy, deep-black, polished frames, and thus lose in value. Small or mediumsized photographs that are somewhat obscure are often framed showing wide margins, so as to render them more conspicuous; but to choose mounts of the proper color is not an easy matter. Lastly, we must consider whether the picture hangs on the wall or is standing on a table. In the first place the frame may be simple and hence less conspicuous; in the latter, a more elaborate frame should be overlooked, as it is, in this case, generally of small size.

As regards titles, its primary purpose is to distinguish one picture from another when reference is being made to them, and from this point of view a mere number would suffice; but just as the mount is used in exhibition work not merely to stiffen the print and hold it flat, but also to isolate it and concentrate attention upon it, so may we make the titles of our pictures serve some further purpose beyond that of mere classification. They may help the spectator to look with our eyes or from our point of view at our efforts, and may be made either to add to or to detract from our success. The selection of a title to serve such a purpose calls for some little care. Although its choice may be the very last stage in the production of the picture, the general character or lines of the title must have been consciously or unconsciously in view from a very early point in the work. We may not have allowed our motive to crystallize into words; but we must have had a motive if the picture is worth a title at all, and the title, if it is to suggest a motive, must in some way suggest that particular one. The mere fitting of a ready-made title to a print is a poor game at the best. In choosing a title it is well to try and steer clear of challenging contradiction. However effective a picture may be in itself, it is a very serious handicap to it to provide it with a title which invites the spectator to disagree with whoever gave it that label.

TALKS ON COMPOSITION IN PORTRAITURE

By J. S. C.

I HAD hoped to have followed my article in last month's issue with a little further discussion of the photograph reproduced, and make a few suggestions for poses which might be effective for that subject, but lack of time compels me to defer that until the next number.

Instead, I will say a few words about criticism, and its value to students.

I remember, when I first entered a class in an art school, I was engaged one evening in drawing from the cast, and had selected a fine head of Voltaire upon The character was which to work. strongly expressed, and, had I but known it, it was a difficult subject for a novice to attempt. I had heretofore confined myself to drawing in outline and had not ventured on the subtilities of shading; but I had the feeling that my teacher was holding me back rather unjustly and determined to show him how clever I really was. So I started in with great enthusiasm and worked like mad for nearly two hours while he was viewing the work of the rest of a large class. I was congratulating myself on my wonderful progress, and felt that the drawing was nearly completed, and was wondering just what words of commendation he would offer me. Suddenly I was conscious of him standing at my elbow, viewing my work in silence. With a feeling of exultation I turned to him, but wishing to appear modest, said: "I only started this drawing this evening, and haven't gotten very far along with it. I can't seem to get the shading right." "Hm!" he replied; "I don't care anything about that—I was looking at the drawing of it. The proportions are all wrong. Turn your paper over and start anew, and confine yourself to the outline. You'd better try a simpler subject next time, anyway.'

Duly crushed, I meekly obeyed, and worked faithfully for the rest of the week in the endeavor to draw the thing in correct proportion, and found how really difficult a subject it was and how inadequate I was to copy it. I then compared my efforts with the "drawing" that I had produced in two hours, and was amazed to find that what I had viewed with such complacency was a mere caricature compared with the one in outline, defective as it was. It taught me a valuable lesson in humility, and that one may not hope to produce anything really creditable without a great deal of study and hard work. However much he may be impressed with the idea that he is a fledgling genius, and is destined to amaze the world by his lofty flights, he will find that he must remain for some considerable time in the pinfeather stage, and that he must pass through many heartrending hours of uncertainty as to whether the wings that are sprouting will prove to be those of a soaring eagle or merely a barnyard fowl.

There is nothing for him to do but to "plug" away with grim earnestness in the determination to conquer or die, and out of his efforts will be born a skill to accomplish and, what is fully as important, the wisdom to judge himself. And while the possessor of true ability may oftentimes be really handicapped by a growing sense of his own littleness, and is blind to the true excellences and promise in his work, it is also true that everyone needs to be "whacked" occasionally by just criticism to prevent his bump of egotism from being abnormally devel-

oped.

This has often been suggested to me by studying the work of photographers. I am willing to grant all the praise that is due to those who labor with the camera and feel that results have been achieved that are truly remarkable, in some instances. Oftentimes I am moved by some clever piece to exclaim, "The one who produced that is an artist!" implying not only the possession of innate feeling, but knowledge and training in the execution. But how frequently is it the case where this same innate feeling has led to a happy choice of subject, with a more or less charming result, that the

author of it has had his head turned a bit by the enconiums that are heaped upon him. He thereafter moved about in a rosy haze of self-satisfaction which effectually blinds him to his habitual shortcomings and throws an aureole of beauty around work that is marked by glaring defects. And alas! adverse opinions of his work produce only injured feelings or are loftily ignored.

At such times I long to set the zealous picture-maker in the classroom of some art school, where he may meet a stern and righteous critic who delights in breaking the heart of the presumptuous tyro and who effectually relieves the

tightening of his hatband.

A curious idea seems to find lodgment in the minds of some photographers who "believe in artistic work," that the road to its achievement may be short and very direct. If such an one is proficient in photographic technic, he believes he can attend a course of lectures, read a few books, etc., then shut his eyes and turn around three times, and lo! he has become an artist. Whereas he used to make "pictures," he now makes "pic-tures, plus art." It is like changing the style of mount—all you have to do is to stick it on. It has not dawned on these people that art is the unfolding of the inward sense, and may not be accomplished suddenly. You cannot make a plant bloom in an instant by dousing it with a bucket of rainwater. But night after night let the dew gather silently upon it, and be distilled each morning by smiling sunbeams, and in time the buds will shoot forth and expand into flowers, until the air grows heavy with their perfume.

Equally fallacious is the tacit assumptiom of some who have won recognition in the photographic world by work of considerable artistic merit, that they have imbibed all the knowledge they need, and, having sucked one orange dry, they have no further use for orange trees. They feel entitled to a pedestal, and perpetual supremacy over their more humble brethern. But they will find that, while pedestals are eminently suited to works of art, they are not made for artists. They are too narrow and do

not admit of the expansion of pro-

gress.

Be wise, O members of the craft, and look open-eyed straight at facts! Will you not admit that you are just beginning to progress, and to awake to the possibilities of photography as an art? Measure your status as artists by the actual knowledge you possess, and how much you would be able to accomplish if your hand had to produce that which the sun and lens execute for you; that is to say, that you should be able to analyze the result and determine every point that combined to make it effective, the same as you would had it emanated from your brush. Tell me, furthermore, Do you regard your craft with the same sacred devotion that the painter pays his art? Is it the exacting mistress that will demand any sacrifice, the utmost selfabnegation from you, and you will grant them cheerfully? Is it the proud, imperious goddess under whose frown vou faint and in whose smile you live and are transported to a world of ecstacy? When you can answer these questions with an "Aye!" you may call yourselves artists and present your works as true children of your brain. And it shall pass from all reckoning whether the medium was brush or camera.

The painter must give years of arduous and devoted study to learn the methods of his craft. He must spend years more in acquiring experience and absorbing impressions before he can begin to evolve ideas that are worth while, and finally, after a lifetime of serious, devoted effort, he will declare that he is just ready to begin. Can a photographer, then, hope by a little brief activity, a little dabbling below the surface, to accomplish what his brother with the palette will affirm is measured by the scope of a lifetime? If he desires to answer the threadbare query, "Is photography art?" he will submit himself to a training as arduous, a striving for improvement as incessant, a life as faithful to ideals as the painter, and we shall await his reply with anxious and fraternal interest, and be ready to add a tripod and shutter to the paraphernalia of the

Muses.

SOME NOTES ON HOME PORTRAITURE

By JAMES MASTERS

LTHOUGH the following notes are written primarily in the hope of helping the amateur photographic worker, there may, perhaps, be found a few hints of interest to many professionals. That it is possible to do good portrait work in an ordinary room no one will care to deny, but that the room offers advantages over the majority of photographic studios is a statement hardly likely to prove acceptable to the average professional. The fact, however, remains—and it only requires a fair and impartial trial to prove it—that, except in a few minor details, an ordinary fairly lit room is as good, and in many respects better, for the purpose of portraiture than is the average photographic studio. It may perhaps be argued that no one would go to the expense of erecting a studio if he could work equally well in an ordinary, fair-sized room. early days of photography a well-lit studio was an absolute necessity for anything like a reasonable short exposure; but with the extreme sensitiveness of modern dry plates and the rapidity of present-day lenses the necessity for an abnormal quantity of light for indoor work has altogether ceased to exist.

To the sitter the ordinary room offers the advantage of his being in everyday surroundings, and there is also the important fact that the lighting is more natural than is the case in most studios. Many professionals will at once object to the use of a room on account of the entire absence of top light, but if they would only stop to consider the matter they would come to the conclusion that what seems to be a defect is, in reality, a decided advantage. Is it not strange that, after having his studio erected with the usual, and generally supposed necessary, top light, the photographer sets to work, by means of blinds or other contrivances, to cut off the light from this source? Some modern studios have only a side lighting, which is really all that is required, but there are still many professionals who would feel quite unhappy had they to work without an ample amount of top light, light which is not only unnecessary, but tends to give a false and unnatural effect. The arrangement of the majority of studios seems to have been originally made with the idea of giving an open-air effect of lighting; but no one would reasonably expect to see a lady in evening dress standing in a (painted) meadow or by a rustic bridge; neither is it usual to see a gentleman minus his hat, sitting in an elaborate chair against an interior background with a scheme of lighting which would suggest that he is under the open sky. Such incongruities as these are, however, often perpetrated, more especially by the cheap, third-rate professionals; while the amateur, without the means at his disposal for producing such effects, generally gives us (whatever else his work may be, and unless his negatives are hopelessly under-exposed) a fairly natural scheme of lighting. Speaking from the pictorial point of view, another defect of the studio is that there is generally too much light; and by this I do not necessarily mean that the quality of the light is too good, but rather that the source by which it enters the studio is too great, and therefore concentration of light on the sitter is not so easily effected as it is in an ordinary living room.

These rambling notes on professional studios may possibly be of little interest to the average amateur, but it is hoped they will convince him that in his own everyday surroundings he is not handicapped to the extent he is liable to think he is as far as portraiture is concerned. Varied effects of lighting are obtainable with very little trouble, less in fact than is necessary to the professional in his well-appointed studio. The latter is apt to use his camera far too much from the same standpoint, and to depend for any variation in the lighting upon altering and manipulating a complicated system of blinds. The amateur, however, as a general rule, depends on light from a comparatively small source; as his "back-









BY LOUIS FABIAN BACHRACH

BOSTON, MASS.

ground" more often than not is of very limited dimensions, any radical change in the position of the sitter is altogether out of the question. The only thing then to do is to shift the camera, and it is surprising what a variety of effect is obtainable by this very simple expedient.

It is a difficult matter to satisfactorily photograph a large group in the home, and here it is that the use of a studio is a decided advantage. Small groups of

not more than two or three persons can, however, be fairly well managed; but if the regulation family group is to be attempted the best thing for the amateur is to take his sitters to the lawn or the humble backyard and endeavor to do his best there.

In conclusion it may be well to state that the writer has had very considerable experience in studio work, and is speaking with some knowledge of his subject.

MAKE YOUR DREAMS COME TRUE

Be not afraid to dream. Some dreamer planned Each work of art—each structure in the land. 'Tis no mistake to dream; but you must do All that you can to make those dreams come true.

CHARLES H. MEIERS



BY LOUIS FABIAN BACHRACH BOSTON, MASS.

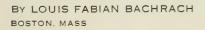




By LOUIS FABIAN BACHRACH BOSTON, MASS.











BY LOUIS FABIAN BACHRACH

BOSTON, MASS.

A FEW THINGS MY CAMERA HAS TAUGHT ME

By GRACE C. RUTTER

ESIDES the mysteries of chemical action, the lore of acids and alkalies, the tone values of certain lights, and the importance of correct temperature, there are many other things the use of the camera has taught me: There is the way to coax the sunshine to a baby face; the right word to put animation in a tired business man's portrait or bring unconsciousness to the face of a primping miss; a certain gentleness to soothe and put at ease before the lens a pet animal or a timid child; or a bit of reminiscence, well told, to light up grandmother's dear old eyes while I photograph her to the satisfaction of descended generations. If we photographers could but have a chip off the "blarney stone" in our studios! We need the gift of tongue so often.

How differently we see things from behind the camera! It is all in the viewpoint. My camera has been an eyeopener to me. This habit of searching for more than appears on the surface—be it a human face, a summer landscape or a prosaic commercial view—is of untold value in any walk of life.

Did you ever notice those old fenceposts in your neighbor's pasture lot across the pond which makes such an attractive picture from your veranda? Well, just go over there and set up your camera in an attempt to make a picture of your home with the pond in the foreground.

Here the bank curves away through the picture, leading the eye to a clump of willow saplings in exactly the right spot for a balance to the house and its mirrored reflection; but in the foreground are those posts—immovable as the town clock, ugly as sin and ruinous to any view, even a commercial print. Moving closer, to avoid them, the composition takes on a less desirable aspect and leaves much to be desired—you are too near to include the willows and the curve



BY LOUIS FABIAN BACHRACH BOSTON, MASS.



of the bank is cut off and—hang it all, anyway!—you never saw those posts before.

True, there are remedies—several ways whereby you may contrive to effect a pleasing picture; but printing from a "straight" negative is preferable to the exacting task of toning down undesirable parts of the same or the uncertain results of any process of dodging or printing in.



BY LOUIS FABIAN BACHRACH BOSTON, MASS.

How many times have I irreverently wished I could rearrange the landscape to fit my lens and ground glass. Who has not been there?

I have learned to sense a sound. To be sure, my film will not record a songster's warble; but, given a good light for a quick exposure, the image of his swelling breast and uplifted head conveys to all beholders the impression of song.

With my mind's ear I can hear the mightly voice of the ocean in a picture of dashing surf just as truly as though I were walking where every step filled my shoes with beach sand. The deep tones of thunder are plainly visible in that picture of inky cloud against a summer sky.

A camera is a splendid book of nature. Say, I never willingly left my warm bed before sun-up until the desire to experiment with ray filter and orthochromatic plates spurred me on, and I never really saw a sunset until I began to observe different cloud effects through my camera. A gurgling brook was but an incident in a stroll, prompting an unhappy thought of wet feet; now I know it sings as it flows and that the sun's glints on its bosom release a myriad of rainbows to delight the eye.

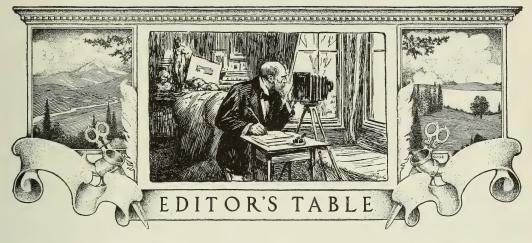
Do you know what time of day an old apple tree looks its best under a summer sun, or which point of the compass is apt to give you a lull in the wind toward close of day? Did a hundred other phases of the sky, the wind, the trees, animal life, facial expression, colors, silences and rapt joy of living outdoors ever occur to you? Such thoughts never were mine before I clicked a shutter or adjusted a focus cloth, but now the camera has made them a part of my being.

Then there is the training of the eye to recognize the best composition. Never again to me will a picture gallery seem a place of hard benches and prosy corridors; it is like a stroll among scenes of real life, the smiles and tears freely

mingled.

See these happy harvesters—their faces eloquently picture joy in honest labor; another canvas shows a mother bending over her sick child. Which is more beautiful, the lovelight in her face or the pink and gold sunrise tints peeping through the window? Here is a peaceful ship on a calm sea; there a battlefield of carnage and misery, defeat in the face of the commander, death on the faces of the fallen men. I am glad to look away to these lovers although, plainly, a misunderstanding is keeping her from his eager arms. There is a Madonna—how very holy the painter must have been to depict such purity and loveliness; I want to fall before her pictured saintliness and murmur an ave.

And so I go from canvas to canvas, until all too soon comes the hour for closing. Ah! had my camera done no more, the money the non-understanding deemed squandered on its cost I feel has been well repaid me in my enjoyment and appreciation of the masters.



GREETING

NCE again this planet has revolved round to the Yule-tide season, and it has witnessed events of immense magnitude with the prospect of Peace on Earth and what it portends with all its multitudinous phases for the future of the world and the welfare of our country.

To all our readers and co-workers, old friends and new, overseas and here at home, health and greeting as the old year passes to make place for the new!

When the last page of this number of the Journal is read and passed, the magazine will have a record of fifty-five honorable years wholly spent in the service of American photography.

The record is one which we enjoy alone in photographic journalism. The turning of that last page is worth a thought.

During these years photography has enlarged its boundaries. It is the world's helper and the world's hobby. It has been our work and happiness to watch and record its growth; to keep American photographers abreast of its progress. In the lapse of years, this JOURNAL has made its way about the world, and is seen and read in every civilized country.

Its growth and its renewal, year by year, keep its editor young. And today, turning the last page of our fifty-fifth year, our thought is of the year to come.

Photography goes forward by leaps and bounds. The American photographer—as is his wont—keeps at the

front. Our greatest desire—now, as in the past—is to push the good work on, to be more useful to the world, and especially to the readers of this JOURNAL. For this there must needs be cooperation; readers and editor must get together. This JOURNAL is for you and we wish to serve you. The reader enjoys his JOURNAL throughout the year, as a thousand expressions of opinion tell us; the editor enjoys his work insofar as he feels that it helps those for whom it is intended. But, once a year, the editor has an anxious time: The majority of the subscriptions on his books (the bone and sinew of his work) expire at the end of the year. How many will be renewed promptly? The answer to that question largely determines the measure of his usefulness during the new year. And the answer depends upon the individual reader!

Our plans for the coming year are already fairly complete. Difficult though the work may be, and we must ask the kind indulgence of our readers during these trying times, the JOURNAL is to be improved and made better in every department. New features, new writers, new illustrators, and a broader policy make up the outlines of the general plan. Professional work, practical instruction, the business department, and manipulation are to be given special attention by experienced men who will offer profitable ideas. The best work of the year, as it appears, will be reproduced among our pictures. As in

the past, so in 1919, whatever is good, new, and desirable in photography will be found, month by month, in the JOURNAL. We invite the renewal of

your support in the work.

Has the JOURNAL proved itself a good investment to you during this year? Have you found it useful, interesting, directly helpful? Let us have your opinion—early *this month*, if possible with your subscription.

AVERAGE PORTRAITURE

HERE does professional portraiture stand at the present day? At once there comes to mind many of the famous names in the profession—men who make portraits that challenge attention, do justice to the sitter, and go far to answer the question, "Is photography art?"

It is not this sort of portraiture that we are concerned about. We mean the everyday portraits that are made for

the everyday man.

A short time ago a friend of ours brought home some proofs of pictures he had been sitting for. They were passed round and commented on by a circle of friends, and the comments were interesting, though far from complimentary. The studio responsible for the portraits is one of the best known and most representative studios in New York.

The general comment was that they were good as photographs but mightly poor as likenesses, and if the photographer could not get somewhere nearer a likeness of his average customer they would not care to spend time and money

on portraits.

A pretty strong commentary on photography in 1918—an art which is particularly *the* art of reproduction, of portrayal,

of portraiture.

We could have told our friends of half a dozen photographers, within a mile of where we sat, who could make portraits they would be proud to have owned; but not being millionaires or celebrities the prices would have been out of the question—five, ten and fifteen dollars per print being somewhat above the ordinary man's ideas of photographs to

give away to friends.

The photographer who photographed our friend posed him in a high-backed, much carved, and decorated chair; the general pose was stiff and formal; the head was posed in a manner quite foreign to the everyday manner of the man.

This was pointed out to the operator at the time, but he was evidently more anxious to get through with the sitting than to make a satisfactory portrait.

The result was that we were too vividly reminded of the "family album" of old days, with the awe-struck and awe-inspiring family portraits familiar in the days of our youth.

There was no connection between these portraits and the magnificent work we have seen at convention exhibitions and in the portfolios of many of our

leading workers.

The remedy is obvious. The photographer must get down to bed-rock principles—must get down to making likenesses.

A mere map-like reproduction of a man's features is not enough. Man is made up of body, soul and spirit; we are not speaking of tailor's dummies. The photographer must get more than the physical man; he must get the characteristics of his subject.

Every man to his humor: Some are cheerful, some are melancholy; some are active, others indolent; some are gen-

erous, others are mean.

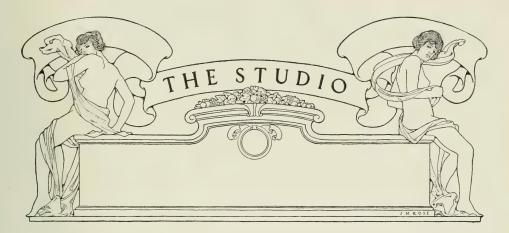
The photographer who knows his business will secure a likeness of his sitter, bringing out the best that is in him, accentuating his best points and diffusing the bad ones.

Even the worst of us have some good points and the mean man is not altogether mean. Find the good side of his nature and enlarge upon it; you will

please him and his friends.

Study your subject: Do not handle him as if he were a lay figure; arouse and keep his interest; make him forget that he has come to your studio to spend thirty-five or forty dollars on photographs for his friends.

If you succeed in this you are well on the way toward securing a likeness that he and his friends will be glad to have.



PRACTICAL PAPERS ON STUDIO WORK AND METHODS

The Focussing Screen

THERE is no part of the portrait photographer's apparatus which is more frequently misused or over-worked than the focusing screen. It is safe to say, indeed, that nineteen portraitists out of twenty ask this much-abused accessory to do work for which it is quite unsuited. The inevitable result is that the quality of their work suffers and their business does not flourish as it should.

The focusing screen of a portrait camera is simply intended for focussing the image and placing it in its proper position and for helping to calculate the exposure by the amount of illumination which it shows. That is about as far as it can go toward the making of a portrait and, if it is relied upon to a greater extent, it is more likely to become a hindrance than a help.

The more skilful an operator becomes, the less he relies upon his focussing screen. He learns that the image it shows is deceptive. The finely graded emulsion of a portrait plate will pick up detail which is hardly visible on the comparatively coarse grain of the ground glass. What looks like a mass of impenetrable shadow on the focussing screen may become a pleasing, luminous, low-tone in his picture—provided the proper exposure has been given.

Many of the most skilful operators in portrait photography never worry how the picture looks on the focussing screen until they are ready to make the exposure. They have trained their eyes to look direct at their sitter, to note every little play of light and shade, to measure the depth of a shadow, and to know when to heighten or subdue the high-lights. They have learned to settle the composition and lighting of the picture

before resorting to the camera at all.

One of the ablest photographers admitted recently that he had not looked through a focusing screen twenty times in as many years. He leaves the focusing to his assistant while he concentrates his own attention upon the posing and the lighting of his sitter. When everything is ready, he gives a signal to his assistant, who brings the camera into position and focusses the

image. As soon as this is done, another signal is exchanged, the plate-holder is inserted by the assistant and the bulb is pressed by the photographer whose attention has not been diverted, even for a moment, from the artistic side of the task in hand. This method of working undoubtedly goes a long way to account for the sincerity and the spontaneity, the natural posing, the effective lighting, the pure tone rendering and all the other high technical and artistic qualities

which distinguish his portraiture.

Needless to say, this man is a photographer of much experience and that may explain in part, at least, his personal indifference to the focusing screen. The inexperienced operator, who is often more timid and bashful than his sitter, would be unable to proceed at all if he could not hide his head at frequent intervals under the convenient black cloth. It is certainly a trying experience for a youth who has just finished his apprenticeship to find himself face to face in the studio with a frock-coated local celebrity or a great lady in an evening gown. And the operator whose lack of self-confidence first drives him to an excessive use of the focussing screen is only too apt to continue in the same bad practice all his life as a mere matter of habit.

There is another point of view to consider—the point of view of the sitter. Can you guess the feelings of a shy or sensitive sitter who patiently waits for the photographer to look on the focus-sing screen, shift the camera, about, take another look, reef a curtain, look again, move the reflector and so on for ten or fifteen minutes? Can't you imagine how disconcerting and irritating it must be to sit there with the muzzle of a lens levelled at you point-blank, at short range, and a man behind it with his head buried under a black pall, issuing instructions about turning the head, raising the chin, closing the lips, and looking a little to the right or to the left.

It wouldn't be very pleasant, would it? If that is your method of working, can you wonder that there are still people who say that they would rather go to the dentist's than have their

photograph taken?

Don't be a slave to your ground glass! Learn to pose your sitter, arrange your lighting, and make all your preparations before you bring your camera into play. You will get better negatives, better expressions and—better orders!—Professional Photographer.

Reflectors and the Eyes in Portraiture

One of the very first things the photographer reads about home portraits is almost sure to be concerning the value of reflectors for lightening the deeper shadows; but what is much less often referred to is the danger of using a white reflector near the sitter, from its tendency to introduce false lighting effects. Even in the work of skilled exhibitors one can often see indications of the misuse of such a reflector; and it may be noted that this is far more common in amateur than in professional work. The exaplanation of this is, in all likelihood, that the professional photographer has a studio in which there is plenty of light, and is not often tempted to use a reflector, except for some special prupose; whereas the amateur, working in an ordinary room, and obsessed with the idea of keeping his exposures as short as he possibly can, puts his sitters near the window, thus getting one side of them in a strong light and the other in deep shadow, and so finds himself compelled to have a white reflector on the darker side, to avoid too strong contrasts.

It is better, whenever it can be done, to work much further in the room and to give longer exposures, as this at once does away with the need for reflectors, and therefore with the faults which they often introduce; but if this is not practicable, then instead of a small white reflector we should use as large an area as we can of a darker tint. A plain gray background may be hung up and used for such a purpose, and may be put nearer to the sitter than it is ever safe to have a white one. Even a dark surface near at hand will reflect more light into the shadows than they derive from the distant walls of the room, because it is both nearer to the sitter and nearer to the window. Those who have not tried some simple arrangement of t hat kind will be surprised to find how distinctly lighter the shadows become even from such a reflector as a dark rug or table-cloth hung near at hand.

The false lighting caused by a reflector may take two forms. The most conspicuous is usually the illumination which it throws into the shadows from some quarter which is very evidently different from that whence the principal light is coming; but another form, which is not so readily traceable by the novice, is the secondary reflection which it sets up in the eye. With a single source of light properly arranged there is only one strong high-light on the surface of the eye, and that a very small one. When there is a very light area in the room, so placed that it is reflected in the eyes, we get a second high-light, often comparatively large and giving an altogether false effect.

We suspect that the professional photographer, if he gets such a result, does not hesitate to take it out in the retouching; whereas the amateur, if he has recourse to retouching at all, is naturally rather reluctant to meddle with so delicate a part

of the portrait as the eyes, and is also less skilful with the knife, which this defect needs, than with

the pencil.

It is therefore all the more important to prevent its occurrence. This can be done by being on the lookout for it when arranging the sitter; by being very careful in the use of white as a reflector; and by avoiding portrait photography in rooms, the decoration of which is very white. For the same reason white or very light paint is unsuitable for studio walls; and if one end of a studio is painted white or hung with a very light background, it should be covered up with something darker if a portrait is being taken at the other end of it.—*Photography*.

System

System is the ground-glass of business. It enables you to focus every little detail of your business with accurate sharpness. The successful business man is a success because he knows the cost of everything and sells at a certain profit. The successful photographer often owes his success to his ability as a workman and his personality. A good business man might capitalize the photographer's ability and personality, pay him a salary equal to the money he would make as his own master, and still make a good interest on his investment. This he would do by the certainty and economy which system makes possible.—Studio Light.

Studio Advertising

There are two main reasons why the output of a photographic studio has established itself as one of the necessary luxuries of the land: First and foremost is, perhaps, that it caters to the vanity of its patrons and affords boundless opportunities for self-gratification in perpetuating an attractive face and figure, effective gowns, and all that is so fascinating to the feminine mind; second, in the fact that it is the only method by which at a commercial price portraits of the family may be obtained and handed down to posterity. These two reasons alone have made for photography a place in the public esteem that will probably never be supplanted. Its importance is growing every day, and the more good work that is turned out the greater becomes the demand for it. Under existing conditions there is no question but that the field of photography is becoming larger every year, and the only question to be considered is that of the individual studio and its ability to create the largest possible demand in its own community and to hold the custom thus created for itself.

The first step in this direction must, I believe, be made from within, and the photographer who is desirous of increasing his output and enlarging his field of operations must be thoroughly impressed with the dignity of his profession, the necessity of using every possible means for the improvement of his work, the raising of his standard of excellence and prices, and keenly alive to every opportunity that he can develop for the keeping of his name before the people whom he desires to make his customers.

Just how this may be done to best advantage is a question that must be settled for each individual case. There are, of course, general principles of publicity that will attach to all photographic studios, but the local conditions must be taken into account in every case and those methods applied which will best fit into them and that will have the most direct bearing upon the special class of trade which the studio caters to. As in the case of the ready-made clothing firm and that of the exclusive tailoring establishment, so must the photographer gauge his announcements to meet the conditions prevailing where his studio is located, and the man in the Western mining town, whose business is just as dignified and just as important to himself as the business of the most exclusive Fifth Avenue photographer, must fit his advertising methods to his clients if he will make them productive of business

A well-fitted advertising plan should, however, be a part of every photographic studio's policy, and a certain amount of money should be laid aside each year to develop the plan on well-thought-out lines. This amount may be much or little, and need in no case form a very considerable proportion of the yearly expenditures if

properly handled.

The reasonableness of this assertion becomes evident on examination of the policy of the general business concerns of this country and abroad, in almost every one of which a certain definite appropriation is laid out each year for publicity. The advertising expenses of any successful business today are just as much a part of the running expenses of that business as the salary account or the appropriation for heating, lighting, trucking, and other essentials of the

establishment.

Many photographers are coming to realize this fact and are profiting by it greatly. There are, however, a great many others who do not seem to realize its importance and are inclined to under-estimate its vaule in the building-up of a successful business. A prominent advertising specialist in a recent publication says: "Constant iteration of even the most preposterous thing will in time shake the soberest judgment and in the average human being induce belief in the unbelievable. The kernel of the nut is constant, circumstantial, convincing reiteration of the point you want to make. That is advertising—however you do it, it's advertising. By word of mouth—by word of type—in newspapers, in letters, in circulars, on signboardsanywhere and everywhere saying over and over the same old thing, but each time with a little different slant to it-a different brand of corroborative detail.

In view of this quotation it is apparent that no one method will cover the ground completely or adequately, but that every legitimate means by which the good qualities of the studio output can be brought before the public forms a proper part

of its advertising policy.

Let us, then, in this paper take up one single point which presents the best field upon which to elaborate at this time, namely: the display made by the photographer at the door or window of his studio. This is his own individual interpretation of an important part of the publicity question, and should have the most careful thought and the most artistic taste of the whole establishment to make it complete. The show-case or display window is, when properly arranged, the keynote of the quality of the work that its patrons may expect and demand in return for the dollars they pay its proprietor. Publicity of this kind is special publicity. It appeals to all classes of the community who are likely to pass the studio either in pursuit of their business vocations or on pleasure bent. It should, therefore, contain sufficient variety of subject and interpretation to appeal to both these classes. Its arrangement should be such that its appeal is practically irresistible, and the true value of this kind of publicity may be more easily gauged than almost any other kind that can be named.

If the show-case or display window does attract attention, if there is constantly or frequently grouped about it a collection of people intently studying its contents, it may be called successful. If, however, it remains unnoticed day after day, only attracts casual and careless attention, it may be taken as an indication that there is something wrong in the display or its arrangement, and the wideawake business man will see to it that something is introduced to create a sensation or an

interest without delay.

One of the most attractive window displays to be seen in the entire length of Fifth Avenue, New York, is that of a photographer whose name is widely known and whose work has been displayed in many of the larger cities of this country. His facilities for making a display are undoubtedly exceptional, but there can be no question of his belief in publicity of this kind, nor of its value in attracting attention to his studio. Handsomely grouped upon a very dark velour background is always to be seen a large collection of fine prints on modern mounts, of subjects attractive both for their costumes and for the public interest attaching to the sitters. The range of subject is such that the society woman, the city official, the man prominent in State politics, and those interested only in good photography for its own sake may almost always be found before it. The interest awakened by such local displays as this is a live interest which may be awakened to a much greater degree than it now is in other localities throughout the country

There should always be something in the photographer's show-windows or display cabinet to which some local interest attaches. If he has not the advantages of larger city studios in displaying subjects of social or political prominence there are in almost all communities views or happenings of more than passing interest. Such subjects offer means for window display that will attract and that will cause comment and exchange of opinion, in all of which the name and fame of the photographer will, of necessity, be

associated.

Class advertising of all kinds is necessarily restricted in the field that it may cover, and this applies with particular emphasis to the show-case or display window. It is apparent at once that only those who pass or who may be brought into its vicinity by other announcements will come under its influence, and it is, therefore, all the more important that this influence be strong and continuing, that the impression left upon the eye

and mind of even the passer-by be such as to recur and cause a more careful examination when

next before it.

Many mistakes have been made in the arrangement of window displays, one of the most noticeable of which is in crowding the space at hand with a heterogeneous mass of subjects, thrown together with too little taste and judgment and representing in addition to, perhaps, a few specimens of really good photography many others that are indifferent or wholly bad. Few studios of the average caliber can afford to show more than a few specimens of work in such a show-case as the writer has in mind.

There are many reasons for this, prominent among which is the fact that many subjects of excellent rendering and, perhaps, of people prominent in social life are barred from the window and cannot be used. It is, therefore, all the more necessary that the show-case be not crowded with many subjects, but that those it contains be selected with great care and that they be frequently changed, and that the keynote of each display be variety, good taste, and

high quality.

The love of pictures is inherent in every community, and if a display contains these elements it cannot fail to interest and attract. With such a display as a basis for comment, criticism, and personal advertising, there should also go some other method or methods calculated to reach a broader field and interest a very large proportion of the community who do not naturally come within the radius of the show-case. Some of these methods will be touched upon in future papers, but at this time it is too late to put any new plans into successful operation for the holiday trade. I believe, therefore, that the best results are to be looked for in making the show-case talk for the holiday business. See to it, also, that every patron has nothing but good to say of his work and treatment in the studio.

Clothes and Pose

THE right rendering of a sitter's clothes may give the photographer as much trouble as the sitter himself, or rather, in this case, herself. One has to remember that the little imperfections in the hang of a garment, which may not be noticed unless especially looked for at the time of posing, may be conspicuous in the finished print. In this particular ladies are generally more exacting than men; though when a man is fussy about his costume, he is far harder to please. When there has been much trying of different positions, shifting this way and that, as one pose after another is found to be not quite what is wanted, the clothes are almost sure not to set right. In such a case, when the actual position for the photograph is decided upon, the best plan is to call the attention of the sitter to its various characteristics, and then let her abandon it for a few moments, resuming it afterward straight away. If the interval is spent in a walk across the studio, or in some other free movement, any dragging of the costume will be remedied of itself and in all probability there will only be a very little to do in the way of arranging. It is hardly necessary to say that whatever arranging may be thought

necessary should not appear as such in the picture. Anything that hangs must seem to hang quite naturally, however carefully it may have been necessary to place it in the exact position required. When draping is done, it should at least appear to be free and natural, and not dragged this way and that to show a rounded shoulder or to conceal a hollow in the neck. An easy plan is to determine before attempting the actual draping what is to be done and then endeavor to do it straight away, or at least with the very minimum of alteration. With most lady sitters an easier method still is to show them what is required and leave them to carry it out.—

Professional Photographer.

Go Straight Ahead

In one of the officers' training camps one of the men seemed to think it was absolutely necessary during all drilling and marching that he should watch his feet. The officer in charge called him to the front of the line and told him to keep his eye on the target ahead and his feet would take care of themselves.

Many times it has occurred to us that photographers are not keeping their eye on a target or goal which is ahead of them; they are just drifting along. They do not realize that their equipment is only a means to an end. In other words, when they equip a studio with cameras, lenses, chairs, backgrounds, accessories and stock, these are for the specific purpose of producing photographs, and in order to produce the best photographs they must be replaced with new equipment just as fast as something better is placed upon the market. There is no arguing the question that, at the present time, the upto-date studios which have the new apparatus are getting a large proportion of the business.

You may be very busy, and the weather may be very hot, but just take time enough to find out whether you are going ahead or just drifting along. Make up your mind as to just where you are going and lay your plans and devote your

energy so that you will get there.

At the present time the photographers have a better opportunity than they ever had before. Many have told us that right through the spring, and even now, their business was just the same as their former rush at Christmas time. In other words, they are doing all the business they can this year. It is your opportunity. Are you tak-

ing advantage of it?

Possibly you are in the business for the pleasure which you can get out of it and the profit is only a secondary consideration. If so, you are an exception and not the rule; the majority are after the profit. How to get the largest profit out of the business is the one question which every photographer should consider. There are several ways of doing this. Some prefer to run a photograph factory and turn them out in immense quantities at a medium or low price. Quantity not quality is their motto. Others prefer to turn out the very finest quality. Their studio, from the reception-room right straight through to the finishing department, is equipped with the most up-to-date apparatus. They do not care for a large business but are going to

make the best possible photographs and secure a

large percentage of profit on the same.

Do not be satisfied with the work which comes into your studio, no matter how much it is. The business which comes from transient customers (those who drift in occasionally) may be sufficient at the present time to afford you a living profit and maybe something more, but later on it will be entirely too small, for it is the return customers or the permanent customers that will bring you your profit in the years to come.

All equipment deteriorates with age, and no

All equipment deteriorates with age, and no man should take the entire profit out of his business; something should be set aside to replace what is wearing out all the time. There are some who want to take everything out of the business now and put nothing back into it.

Almost everyone will see, no matter which direction they go, deserted farms, lands covered with weeds and waste, and on inquiry will find out that the farmer who formerly owned or tilled it took everyting off without putting anything back on the land. The result is that it is now barren, and there are many photographers who have taken everything out of the business that they possibly could without replacing it, and they are barren or bankrupt today.—Ohio Photo-News.

Showing Samples

In your reception-room you have a line of sample prints showing, at different prices, the range of styles and sizes you produce.

When a patron or prospective patron drops in to see what you are making, and you display this sample line to them, start at the top and come down. In other words, show them some of your best work first. They may not want to pay for that class of work, and if such is the case, they will probably hesitate before expressing themselves. Don't let them hesitate. As soon as you notice signs of hesitation, show them the next best style and watch for further symptoms, and proceed in this manner, downward through the line, until you notice that interest predominates their demeanor. When a customer appears to be interested, you have undoubtedly shown a sample that meets with his approval and which he can secure at about the price he is prepared to pay.

As you talk with each customer and are descending the scale of price, comparing and discussing the different styles, don't speak disparagingly of the style that brings the lesser price. If the customer can't see the difference or cannot pay the difference in price for the better style, he must not be discouraged in his opinion of the style which can be purchased at the more

modest sum.

Never form your own opinion as to the price

a customer will pay for pictures, as you may underestimate and not only lose the sale of the higher price style but at the same time the customer may resent being shown the cheaper kind. If price is a factor in the transaction it is surely easier and safer to start at the top and come down—easier to sell a moderate price picture after talking high prices than to sell a moderate price picture after talking low prices.

One more point that is vital: Have confidence in the merit of your photographs. Keep your sample line up to the highest standard of quality you can produce. Apologies for the condition or quality of any sample will destroy confidence in the patron, and every sample you show should be right, so that you can stand back of it.—*Photo-*

Digest.

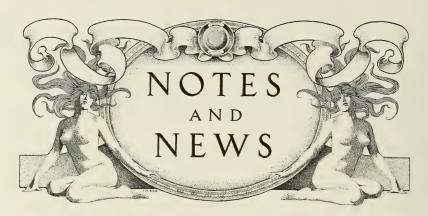
Artist or Business Man

THERE was a time when the photographer was considered an artist. He was not in the same class with business men, he was not considered a business man, and we regret that many of them were not business men. Business was distasteful to him. What he wanted to do was to make photographs and the best that were made in the country. Photography has changed since then. Of course, we do not mean by this that the photographer, especially the operator, should not be an artist; but we do mean that he differs from the old photographer, because now he has his plates and paper coated for him; many of his chemicals are put up in a convenient form for him to dissolve in water and use; photographic mountings are now all ready for him to attach to the pictures. It is entirely different from buying the chemicals in the old way and mixing everything needed from the coating of the paper to the finished picture.

He should still be an artist, inasmuch as he wants to make artistic photographs, or photographs that will please his customers; but he should also be a business man, for the reason that the business end requires more time and attention than it ever did before. Formerly photographers did not consider the business end. In fact, many of our old-time and best photographers never did know anything about business and only took what money was given to them. If a back account was kept, no one ever tried to collect it; but it would be impossible to find a photographer doing business that way now.

While he must be a good photographer, in order to make a success he must also be a good business man. The two things must be combined, otherwise he may make a living for himself and family but he will never get any farther than that. The successful man today is the man who is a good artist and a first-class business

man .- Ohio Photo-News.



Photographers' Association of the Middle Atlantic States

WE have received a letter from that wide-awake photographer, A. H. Diehl, president of the Photographers' Association of the Middle Atlantic States, telling us that the officers of the organization are already planning for the annual convention which is to be held in Pittsburg next March. You can rest assured that whatever the officers decide upon President Diehl will see that it is carried out to the very best of his ability.

One of the things that they want at the Pittsburg Convention is a very large display of portraits, a display that will be helpful to every photographer who attends the convention.

And one of the things which they are going to do to create an interest in this exhibition of photographs, and make it a large part of the coming convention, is to offer medals for the best display of portraits submitted, classifying the work so that all may compete on an equal basis. The judges will be selected from outside the jurisdiction of the organization and will all be photographers.

Photographic Supplies

Never before in the history of photography has the demand for apparatus and material, both professional and amateur, been anything approaching that which exists at the present time. We do not believe there is any manufacturer who is able to keep up with his orders. Indeed, some of them are so far behind and so discouraged that they do not even try to keep up with them. All dealers know that it is impossible for them to get much more than half of the goods ordered within a reasonable length of time.

This same condition prevails in England and other countries at the present time. One of the reasons for this is the fact that, in years past, Germany furnished a large proportion of the photographic apparatus and material, either in finished form or in parts. Many of the English cameras made before the war were assembled in England but the parts were made in Germany.

Every factory is being equipped with the very highest class of machinery for rapid work, and if it were not for the paper being manufactured in this country in all probability photographers would be unable to be in business at the present time.

Every manufacturer and dealer is doing the very best that he can to supply the demand with the help and the material he is able to secure. Every time an order is filled incomplete, and a back-order made, it means a certain amount of extra labor.

Photographic dealers are doing their very best to take care of orders as fast as they are received. But the photographic business during the last three months has been as great with many photographers as it was just before Christmas last year. Some photographers who ordered their goods early, expecting they had purchased enough to take them through their holiday business, find their material nearly exhausted and are re-ordering at this time. Order early!—Ohio Photo-News.

Boston Y. M. C. U. Camera Club One-man Exhibits

PICTORIAL photography has become a matter of deep interest to Boston amateurs, and the Camera Club at the B. Y. M. C. U., 48 Boylston Street, has arranged a series of one-man exhibits by foremost pictorial photographers of the country. Each exhibit will consist of about twenty-five pictures, and the rooms will be open to the public on Wednesday evenings and Saturday afternoons. Work by John Paul Edwards, of Sacramento, Dr. Rupert Lovejoy, of Portland, Me., and Dwight Davis, of Worcester, Mass., has already drawn forth lively interest, and for the remaining months of the season the exhibitors will be these: December, Francis O. Libby, of Portland, Me.; January, Arthur Hammond, of Boston; February, John H. Garo, of Boston; March, annual exhibit of work of club members; April, Arthur F. Kales, of Los Angeles; May, Edward H. Weston, of Tropico, Cal.

Notice to Members of the American Lantern Slide Interchange

In order that slides contributed to the interchange may be returned to their owners promptly kindly notify Mr. O. C. Reiter of any slides you may have in your possession or slides that have not been returned to you.

The North Central Convention

It was a grand and successful convention from every point of view. There were over three hundred in attendance and we only regret that on account of the many doings we were unable to meet personally our large number of customers and friends who attended this gathering.

The meetings, demonstrations and lectures were attended by an unusually large crowd and it is a settled fact that these proved valuable and

most interesting to all.

The following officers were elected for the coming year: President, H. H. Egbert, Atlantic, Iowa; Vice-President, John R. Snow, Mankato, Minn.; Secretary, H. W. Flint, Waterloo, Iowa; Treasurer, R. Zwiefel, Duluth, Minn.; North Dakota, Mrs. W. P. Butler, Bismarck, N. D.; Montana, H. Titter.

A motion was made and carried that the next

place of meeting be left with the board.

The pictures selected for the permanent Salon were made by L. Dworshak, Duluth, Minn.; Geo. Claus, Eau Claire, Wis.; C. H. Galbraith, Minneapolis, Minn.; Lee Brothers, Minneapolis, Minn.; L. D. Sweet, Minneapolis, Minn. The secretary announced that \$10.00 would be paid for each of these pictures and an engraved certificate would be sent as soon as they are ready. The secretary announced that a photograph made by the president was also selected by the judges, but the president refused to allow it to be considered, so the judges recommended that the association purchase Mr. Judd's picture for the salon.

A Photographer and "Photographs of Distinction"

It gives us pleasure to present to our readers this month, prints from the studio of Louis Fabian Bachrach, of Boston—"Photographs of Distinction," a slogan Mr. Bachrach is well justified in applying to his work. Few photographers today are better equipped in up-to-date methods and ideas. Thoroughly progressive and with a zest for the art side of photography, with individuality which is bound to tell, his success is sure.

With a fine and discriminating taste, Mr. Bachrach issues from time to time booklets and notices to his clientèle which reflect the man and his standard. We cannot resist referring to one of these—as fitting and tasteful a brochure as has reached this office in many a day, entitled "The Sun and the Artist." This was prepared by the well-known writer Thomas Dreier, and for the benefit of our readers we are pleased to quote this tribute to this artist-photographer.

"It is comparatively easy for one to be an artist and to express one's now personality in creative work. All one has to do is to follow one's strongest desires. But to have an artist's soul, and to combine with the wisdom of an executive capable of directing the work of other artists, is to be a master and to deserve well of the beauty-

loving world.

"Perfection is the result of concentration.

"Bachrach is a photographer whose pictures are the result of the concentration of specialists. His photographers are artists. They are given

the finest equipment and are expected to give their undivided attention to the production of good negatives. They do not trouble their heads about facing the pay roll on Saturday night.

"Their's is not the work of an executive whose great task it is to keep all the elements in his organization working together harmoniously and efficiently to produce photographs of which a artist may be proud. All their thought, all their study, all their attention is given to their single task. But the work these men produce is the result of the thinking, of the careful planning, of the attention to details, and of the idealism of Louis Fabian Bachrach himself.

"The ideals of no institution rise higher than the dominating personality. It is true, as Emerson said, that "an institution is but the lengthened shadow of a man." Some contend that it is more, that it is but an extension of the man him-

self.

"I never enter Bachrach's place without feeling that somewhere back of all the smooth activity there must be a great source from which a stream of enthusiasm flows. There is much life and light in the place. It seems to be easy for the workers

to smile.

"Bachrach apparently realizes that wrinkles must be taken out of the heart and mind before they can be taken out of a face. It is the inner feeling, after all, which counts for most in the making of a portrait. You may have the costliest lenses, the most skilful photographers, the best plates, and all the sunshine in the world, and still fail to produce a portrait that lives and which one can love.

"'You see,' said Bachrach, one day, 'there is so much inharmony, so many troubles, so much irritation in the world that it seems to me that some of us ought to do our best to create places, like oases in a desert, where there is nothing but good feeling, kindness, cheerfulness, and the spirit

of neighborliness and service.'

"He tried to explain to me that the reason he had succeeded in building up a big business was due to the perfection of an organization that insured mechanical efficiency. But his very manner of speaking convinced me that the reason was something infinitely more precious than ex-

pensive equipment.

"The spirit with which an artist works is of infinitely greater importance than the tools with which he works. Some of the old printers who loved their work built books out of the crude materials at their disposal that still challenge the modern printers who have everything to work with. And it is this spirit at Bachrach's that working through everybody, produces those results which have created friends everywhere.

"'My desire,' said this man who is helped by the sun to be an artist, 'is not to make photographs that merely show the outside of a person. I want to produce portraits which will show the real person. It is easy, you know, to make pictures that look like the sitter. But to get portraits that actually are the sitter—that is the

great task.'
"'I don't want to spend my life making photographs that cause people to say calmly, "Yes, that looks just like you." I want them to say, "Having this portrait of you is almost the

same as having you here in the room-it seems

to be alive."
"'To begin with, we have tried to have the best mechanical equipment it is possible to obtain. Following that we employ only the best photographers—men who are artists in directing the making of portraits that are as near human as a portrait can be. Then we do our very best to keep alive in the place the atmosphere which can be created only by men and women who are happy and contented and eager to express themselves in being useful in a beautiful, neighborly

way.'
"He asked me if I understood what he meant. He seemed to be afraid of being misunderstood, just as most practical, successful business men are afraid when tempted to express their inner-most thoughts about their work. You understand how it is. Successful men talk little about their ideals. They do the work which testifies to the existence of those ideals and trust to the

world to understand.

"For years Bachrach has been doing this idealistic work successfully. His organization has grown steadily and surely. But so slowly has it grown that his own spirit animates every part of it. He himself is as active as quicksilver. He is here, there, everywhere. He knows how to organize and how to inspire enthusiasm and loyalty. The work his organization produces is infinitely better than the work Bachrach did when he was forced to do everything alone. He realizes that, and he sees, too, that he is more valuable as a director of a bigger organization, and can be of greater service to every sitter, than if he spent all his time in the studio with the cameras, or with the developers and printers.

"That man is an artist who can change a selfconscious stranger into a friendly visitor whose heart feels contentment. But he is a greater artist who can create an organization capable of producing this result. Such an artist is Louis

Fabian Bachrach.'

"X-rays"

The purpose of this booklet is to present to the roentgenologist those essential laws and practices which, if followed, will help him to produce negatives that are photographically correct. It is not intended to be a text-book on roentgenology or to usurp the function of such literature. The keynote is instruction in the photographic process. Roentgenographic technic and interpretation are assumed to be part of the professional training of the modern roentgenologist.

The technical sections are compiled largely from the results of investigations conducted in the X-ray Department of the Research Laboratory of the Eastman Kodak Company. These investigations have been published in various journals in the form of scientific papers from While the average person who the laboratory. works with photographic films or plates has a general idea of their nature, there are few probably who know just what such photographic materials are composed of.

The modern film or dry plate consists of a layer, about one thousandth of an inch thick, of

a gelatin containing a silver compound which is extremely sensitive to the action of light. This sensitive layer is called the "emulsion." It will be readily understood, then, from the delicate nature of both gelatin and the silver salt, that the photographic emulsion is very sensitive to treatment of any nature. The emulsion may be coated on glass and we have the photographic plate, or it may be coated on a thin, transparent, flexible base and we have what is called photographic film. When light, or x-rays, or other types of radiation, strike this sensitive surface, a change takes place. This change is too small to be measured by any known chemical or physical methods. However, by treating the layer with a chemical solution called developer, a chemical reaction is produced where radiation has struck, resulting in a deposition of silver, in tiny granules from the silver compound, thus forming a metallic image. Such an image may be primarily formed by heat, by an electric spark, by abrasion, by light, by x-rays, or by radium radiation. In most of these cases we get what is called a negative, that is, the portions that were light in the original are dark in the developed plate.

The amount of exposure necessary to bring about this result and the faithfulness of rendition of light and shade in the original, and freedom from accompanying defects, depend to a large extent on the quality of the emulsion of silver

salt and gelatin.

The speed of a photographic film or plate to x-rays, depends primarily on the absorption or stopping of the incident x-rays by the thin emulsion layer. To accomplish this the nature of the sensitive emulsion must be radically changed from that which is used in ordinary photography. This has been done in the present Seed x-ray plates without any loss in quality and keeping power. The aim has always been to obtain the maximum speed without sacrifice in quality,

uniformity, and keeping power.

The same emulsion, coated on transparent support, forms the well-known Eastman x-ray films. These combine the standard quality of the Seed x-ray plate with the added factors of lightness, durability, convenience of storage and adaptability to dental radiography. Recently, a special emulsion has been coated on both sides of a thin, transparent base, forming the new Eastman dupli-tized x-ray film. By this method of double coating not only is greatly increased speed obtained, but the processes of developing and fixing are simplified, the amount of silver salt necessary being so adjusted as to shorten the developing time about 20 per cent., and the fixing time about 50 per cent.

In making x-ray negatives it is essential to use a material which will show the greatest difference in density or blackness with the slightest differences in exposure, for the tissues of the human body are in some cases nearly as opaque as the material of which it is desired to obtain an outline. It is also essential to use a material which can carry this process of showing small exposure differences, over a wide range of transparencies in the same exposure; in other words, an x-ray film or plate must possess great power of contrast and at the same time be capable of showing fine gradation and detail in the

developed image. These factors have been studied at great length in the Research Laboratory of the Eastman Kodak Company and as a combination of these tests and investigations and the unequalled manufacturing conditions, the Eastman x-ray materials are as nearly perfect as it is possible to make them with the present day knowledge of physics, chemistry, and mechanical processes.

This booklet will be supplied upon request.

Argument to Congress Against Proposed Tax on Photographs, Plates, etc.

St. Louis, Mo., October 23, 1918. Honorable Finance Committee of the United States Senate, Washington, D. C. Gentlemen: Our attention has been called to the proposed Excise Tax on photographic films and plates other than movingpicture films, also that on photographs as embodied in Sec. 900 (Title IX—Excise Taxes), of H. R. Bill No. 12863, entitled "An Act to Provide Revenue, and for Other Purposes." cording to the report of the Honorable House Committee, which drew up this bill, they en-deavored to select articles for excise taxation which fell within two classes: (1) Articles that are more or less a luxury because of their nature, and (2) articles that become in the nature of a luxury when sold for more than a fixed price. Obviously the Honorable House Committee considered neither photographs nor photographic plates and films in the latter class, but did in the former, and in doing so we contend they erred, and in support of this contention we respectfully submit the following brief for the consideration

of your Honorable Committee.

While it is true that a very large percentage of all dry plates manufactured are used for portraits, which latter in times of peace might be considered more or less of a luxury, the fact remains that in times of war these very portraits play a very essential part in keeping up the "morale" of the soldiers and the people. The boys overseas look forward to, and get great comfort out of the receipt of the photograph of the mother, wife sweetheart, or baby left behind, and likewise the portrait of the boy, taken just before his departure, is cherished as is nothing else by his family and friends, for is it not entirely within the range of possibility that it may be the very last living likeness of him? We question whether there are any portrait photographs taken in this country these days which do not enter in some form or another, either directly or indirectly, into the life and welfare of a soldier or his family and friends. In view of this we do not think even so-called small kodak pictures made by amateur photographers should be classed as a luxury, but since the percentage of dry plates used in such hand cameras is exceedingly small, we feel that this is a question for manufacturers of films or others directly interested, to argue.

May we also be permitted to point out that essential manufacturers and purveyors in all lines require photographs in the distribution of merchandise; that newspapers and magazines depend upon photographs for their illustrations; that surgeons and hospitals must have x-ray dry plates or films for the correct diagnoses of their cases; that dry plates and films are used

largely by the United States and allied military forces in the prosecution of the war, the undersigned companies at present turning over a very considerable part of their production to the aviation and other governmental departments.

Regarding the further usages of photographs (for the taking of which dry plates or films are of course required), by federal, State and civic governments, we quote from the *Photographers'* Association News (published in Washington, D. C.) of September 15, 1918, as follows:

"Photography is an invaluable ally of the nation for publicity for liberty loans, the propaganda work of the food, fuel and other arms of the nation, for the committee on Information of the United States Government, the Red Cross, the Y. M. C. A., and the other organizations that

are ministering to the boys in khaki.
"All civilian employes of the Government are required to have photographs of themselves attached to their identification cards. civilians going overseas, even the Secretary of War, are required to have photographs attached to their passports. All employes in munition plants are required to have photographs attached

to their identification cards.

"Every officer in the service must file a photograph with the War Department. The Department of Justice and the police forces of the country depend upon the records of photograph studios for the tracing of alien enemies, slackers and criminals. The General Staff of the United States is depending upon the photographers of the country to supply a history of the war, and through the National Council of Defense representatives of the Photographers' Association of America, have been duly selected by State Councils to handle this work in each State for the period of the war. This was completely set forth in a letter from the War College that was reproduced on pages 281 and 282 of the issue of *Photographers' Association News* of September 1,

In conclusion we desire to state that we were not informed as to the contemplated excise tax on photographs and on photographic dry plates and films until some time after the House had passed H. R. Bill No. 12863, which explains our failure to file brief with the Finance Committee of that honorable body. We sincerely believe, however, that the facts stated herein will fully warrant your further consideation of the advisability of these proposed taxes, and we are hopeful that your Honorable Committee will take favorable action in the matter before reporting the Revenue Bill to the Senate.

Respectfully submitted, G. Cramer Dry Plate Co., (Signed) G. A. Cramer, Pres. HAMMER DRY PLATE Co., (Signed) L. G. Hammer, Pres.

Death of Joseph A. Dawes

THE death of Joseph A. Dawes, of the Wallensak Optical Company of Rochester, N. Y., from pneumonia, on November 2, will come as a shock to his host of friends.

Mr. Dawes, by his bright, cheerful and steriling chracter, was one of the most popular men in the photographic fraternity. He was particularly well equipped for the many demands upon him, always willing and ready to help to the utmost. His going will be keenly felt by his many friends and acquaintances.

The Second International Photographic Salon

The Second International Photographic Salon, under the auspices of the Camera Pictorialists of Los Angeles, will be held in the Gallery of Fine and Applied Arts, Museum of History, Science, and Art, Exposition Park, Los Angeles, California, U. S. A., from January 3 to 31, 1919. All pictures from the United States and Canada must be mounted, preferably on white or lighttoned mounts, not to exceed twenty-six inches in their greater length; while prints from abroad should be sent unmounted. The back of each entry should bear (in addition to the name and address of its author), title and number, printing process used, and, if for sale, the price. Pictures should be sent charges prepaid and addressed, "The Photographic Salon, Museum of History, Science and Art, Exposition Park, Los Angeles, California, and an entrance fee of fifty cents must accompany each blank, the latter and all correspondence to be addressed, Ernest Williams, Secretary, Room 31, Walker Auditorium, Los Angeles, California.

An Exhibition of Pictorial Photography

An exhibition of photographic art was held at the Washington Irving Gallery, 122 East Seventeenth Street, New York, from November 11 to 30, 1918. It was confined to work of pictorialists of New England and New Jersey, and was under the auspices of the Pictorial Photographers of America. This is the first of a series of such exhibitions, and selections will be made, at intervals, for similar displays of pictorial photographs from different areas of the country.

The exhibition was well attended, some excellent work shown, and many well-known photo-

graphic artists were represented.

John H. Garo, Boston, Mass., sent five pictures, every one of which, as might have been expected

of this master, was a gem.

Arthur Hammond, also of Boston, contributed several, "At the Close of a Stormy Day" and "Wingaersheek Beach" being superior to the others. "Pipes of Pan" and "The Old School House-Winter," were printed on paper showing lines forming squares, which were very distracting and spoiled what might otherwise have been quite pleasing.

Dwight A. Davis, Worcester, Mass., showed a number of prints with the beautiful effects of sunshine one expects to find in his work and

which he renders so successfully.

Bertrand H. Wentworth, Gardiner, Maine, had hung two or three of his delightful seascapes. While one sees the splash, the foam and spray, and is led to imagine the thud and the roar, one is impressed with Ocean's majesty, power, grandeur and vastness in all his marines.

William T. Starr, Portland, Me., likewise was excellent in a seapiece entitled "The Breaker;" and another of his pictures that deserves mention

is "The Slacker."

Louis Astrella, Bridgeport, Conn., out of a number of prints, is best represented by "Purity" a charming little nude.

Henry Eicheim, Boston, Mass., is seen most

convincingly in his portraits.
Bernard S. Horn, Princeton, N. J., appears to better advantage than usual, and is particularly happy in his rendering of "Winter Snow," which is not far from being his chef d'ouvre.

Dr. Rupert S. Lovejoy, Portland, Me., had a gem in "Diana Rules the Night."

G. H. Sleelig, Boston, Mass., offered a most praiseworthy effort in his "June."
Francis O. Libby, Portland, Me., is a very accomplished landscape artist. "Glowing Dusk," "Beyond," "The Japanese Pine," and "Silver Waters" have much to admire. The poetry and charm of mystery felt in all these is unusual

George S. Hawley, Bridgeport, Conn., offered in "Stratford Marsh" what was probably the finest landscape in the exhibition. It will be a long while before this is surpassed for poetic

interpretation.

There are others that deserve notice in detail,

but space will not permit.

This exhibition is as good as any and superior to most of them, and it is, therefore, suitable for an example. It teaches the lesson that there are comparatively few photographic artists, notwithstanding that many pose, and are regarded, as such. There is lacking in the work of the majority the elements of art. And when their pictures are shown along with those of real pictorialists their inferiority is clearly apparent. The artistic photographers all manifest the result of knowledge possessed and skill acquired in their rendering, and in the inclusion of the essence and spirit of their themes. With Garo it is in quality-character in portraits, feeling and sentiment in landscape, finesse in still-life; in Francis O. Libby it is poetry; Dwight Davis captures sunshine, and so on with the others. To make it clearer, with painters for an illustration, in Corot we find mostly the diffused light and poetry of early morning and of evening; in Rousseau and Daubigny the repose, quietude and hush of different hours and seasons; Jacque gives us sheep enveloped in tender light or shrouded in mist; Israel and Millet present the homely scenes and acts of mankind in their daily life of labor, love and sorrow; our own Inness depicts the innermost significance of his themes, sometimes reaching the sublime; while Dwight W. Tryon, Wyant and Whistler awaken our admiration and wonder by the mystery, breadth and suggestion with which they have infused their

All this photography is capable of rendering quite as well, and in some respects better, than painting. Painters cannot surpass the atmosphere, feeling and the spirit of Nature, depicted by John M. Whitehead of Scotland, Leonard Misonne of Belgium, Keigley of England or in Mortimer's poems of the sea. Photographers in general do not appear to realize this. The majority are only splendid in technic and statement and altogether lacking in mood, meaning

and the esthetics of art.

This exhibition will be held in the Brooklyn Institute of Arts for three weeks in December.



WORKROOM

ONTAINING THE LATEST PROCESSES, FORMULAE AND APPLIANCES NEEDFUL IN THE ART OF PHOTOGRAPHY FOR THE OPERATOR & WORKER

A COMBINED PERMANGANATE PERSULPHATE REDUCER FOR NEGATIVES

A VERY FINE REDUCER

RETOUCHING DOPE

NEGATIVES FROM PRINTS

A CONVENIENT ACCURATE PHOTOMETER FOR THE MEASURE-

MENT OF PHOTOGRAPHIC DENSITIES

METAL FOR DEVELOPING TANKS

PHOTOGRAPHY IN ASTRONOMY

HYPO-ALUM TONING

TO PREVENT FINGERS FROM GETTING STAINED, SORE OR POISONED

SUBSTITUTE SODIUM SALTS

TOUCHING-OUT SPOTS ON WHITE MOUNTS

PER CENT. SOLUTIONS

CARBON PRINTS ON CHINA

AMIDOL FOR DEVELOPMENT PAPERS

FINISHING CARBON PRINTS WITHOUT SUBSEQUENT MOUNTING

HELPING FAULTY NEGATIVES

SKETCH-PORTRAITS: A METHOD OF DIRECT WORK ON ORIGINAL

NEGATIVE

THE ACTION OF VARIOUS REDUCING AGENTS

SODIUM BROMIDE

MOUNTING WITH ADHESIVE APPLIED ONLY TO THE EDGES

A NEW METHOD OF INTENSIFYING CARBON LANTERN SLIDES

AND TRANSPARENCIES

UNEVEN TONES

FERRICYANIDE REDUCER

THE FEET IN PORTRAITURE



THE WORKROOM

By the Head Operator



A Combined Permanganate Persulphate Reducer for Negatives

A REDUCER for negatives which will act proportionately, and which is under full control and and not erratic in its action, in one of the things for which photographers have been looking for a long time. I believe I have discovered the formula for such a reducer, and would like to pass it on to the photographic world.

We all know the special characteristic of the persulphate reducer introduced by the Lumière brothers years ago—namely, its selective tendency to act upon the denser portions of the image—and a very valuable agent it has proved, especially when used according to the Bennett

formula.

But the persulphate reducer has the disadvantage of being erratic in many hands; for instance, a hardened and an unhardened film may behave quite differently in it; in fact, the hardened film may refuse to reduce at all. Some people say that the reducer acts more satisfactorily on an undried negative, and my experience agrees with this; and dried negatives, it is said, reduce more satisfactorily if soaked in water for one hour before reduction.

Others, again, say that images developed by certain developers are unfavorable to its action.

Then, we all know how it may hang fire for some time and then go off like an express train, and reduction may be carried too far before the negative can be plunged into the sulphite bath.

Again, the persulphate reducer is not proportional in its action; and though its selective action is very valuable when needed, yet a proportional reducer would generally be of much

greater utility.

The permanganate reducer introduced by Namias, in my opinion, is a very valuable one, much more so than the persulphate, and I cannot understand why it has not been more popular. I have not found it to be an unclean reducer, as Bennett avers; and as for stains, I have never met with them when using an after-clearing bath of potassium metabisulphite.

But when considerable reduction is desired, this reducer has a tendency to eat out the halftones or more delicate portions of the image; this selective action, however, is very small when compared with Farmer's reducer. So, practically speaking, when only a slight reduction is needed its action may be considered proportional.

The following is the formula I have generally used when employing potassium permanganate: 1 per cent. potassium permanganate, 100 min.; 10 per cent. sulphuric acid, 50 min.; water up to 4 ounces.

With this reducer, while reduction proceeds regularly enough, the exact time to remove the negative is not always certain, for the image may get a little clouded with a brown stain or deposit (an oxide of manganese). This, however, absolutely disappears in a clearing bath of 1 per cent.

potassium metabisulphite.

It occurred to me one day to try the effect of combining these two reducing agents, when I found, to my surprise, that the disadvantages of each reducer had absolutely disappeared! I also discovered that by varying the proportions a reducer was obtained which, as far as the eye could judge, appeared proportional in its action; that is to say, suppose you happen to overdevelop a negative, then by subsequent reduction in the following reducing solution a result is obtained which, as far as the eye can see, is the same as if development has been stopped at the right stage.

This I have tested as follows:

Two plates having the same exposure were developed four different times; after washing, the denser negative was reduced in this reducer and cleared, with the result that the two negatives are now almost impossible to distinguish.

Now to enumerate:

1. The action starts right away and is quite regular, not hurrying up like persulphate alone.

2. It is not sensitive at all, like persulphate, to small traces of hypo from imperfect washing. In fact, with it I reduced with perfect ease a negative in which I could still just taste the hypo.

3. A hardening bath on the film does not interfere with its subsequent reduction in this reducer, the action being regular, though somewhat slowed.

4. As yet, in my hands, it has never shown

the slightest erratic action.

5. During reduction it is clearer in its action than the acid permanganate reducer, thus the degree of reduction can be more perfectly estimated.

6. The solution, when in use, appears to keep in working order longer than the acid per-

manganate solution.

7. It is a proportional reducer (as far as the eye can see).

The reducer has the following simple formula:

Potass, permanganate, 1 per 20 min. cent. solution Ammonium persulphate . 10 grs. Water to make 2 oz.

It should be made up just before use.

The permanganate is best kept in a 1 per cent. solution (taking 24 grains in 5 fluidounces of water).

The persulphate should be weighed out, or, if more convenient, 1 "tabloid" persulphate (11 grains, near enough) may be used.

You will notice that the reducer is weak when

compared with other formulæ, but it acts quite

rapidly enough.

After sufficient reduction the negative should be quickly rinsed in water and cleared for five minutes (quite) in 1 per cent. potassium metabisulphite, or in an acid fixing bath (I use the

former), and then washed and dried.

Here in the Solomon Islands I have no opportunity for making exact photometrical tests, and so I have had to rely on visual tests only, which may not be quite accurate. If some scientific man like Mr. Renwick or Dr. Kenneth Mees were to investigate the formula, he would probably find that the proportions might have to be adjusted to get strict proportional action, and I think the reducer merits such investigation.

I must say, in fairness, that the tests on which I have based this article are more limited than I should desire, but I must plead the difficulty of photography in a climate in which one rarely can obtain water under 80° F., and in which photographic materials, when opened, deteriorate so much in two or three weeks as to be almost

useless.

A Very Fine Reducer

A REDUCER that is excellent for harsh negatives is made up as follows:

Place the negative in this solution until sufficiently reduced, then rinse well and dry.

Retouching Dope

The best retouching medium I have ever used is made up as follows:

Oil of turpentine				6 oz.
Oil of spike la	ver	nder		2 oz.
Pale rosin				4 oz.
Linseed oil				32 min.
Terebene .				80 min.
Amyl acetate				1 oz.

This gives a beautiful surface to work upon, does not become gritty or slippery under the pencil, and allows of a second application when necessary without the attending trouble of other mediums.

Negatives from Prints

A SUGGESTION is made in the *Trade Notes* issued by Messrs. Rajar, Ltd., that where negatives cannot be kept, in consequence of the demand for glass at the present time, a special print suitable for copying, should occasion arise, should be made and filed. Much of the poorness and loss of quality which is often noticeable in a copy could then be avoided; since it is caused by the brilliant print which looks best, not being that which gives the best copy. The *Notes* go on to suggest that the special print should be made on glossy bromide paper or card, and should be, from the usual point of view, a trifle overexposed. It is best developed with a dilute solution, the aim being to get full detail in the highest lights while still retaining the shadow detail, and

not excessive contrast. The resulting print may have a greenish color and appear lacking in good contrast; but it must be borne in mind that in copying it is an easy matter to obtain an increased vigor. In copying such a print the most regular results are obtained by the use of artificial light; two lamps, one on each side of the subject, in white, matt-surface, half-circle reflectors, being very suitable. There is a good deal to be said for the suggestion. Copying is looked at askance, because most copies are in the nature of makeshifts—the best that can be done when the original negative has been destroyed. The copies which have been made as is here suggested from specially prepared originals, need show no perceptible falling off at all if the operations are properly carried out: and it will be found that this proper carrying out resolves itself into correct (1) illumination, (2) exposure, and (3) development.

A Convenient Accurate Photometer for the Measurement of Photographic Densities

A NOTABLE contribution to the methods of photographic investigation was recently made in a paper and demonstration before the Royal Photographic Society by Messrs. W. B. Ferguson, F. F. Renwick and D. E. Benson, describing a new form of photometer for the measurement of densities which owes its qualities to the joint labors of these three experimenters. The general features and accuracy in use of the Ferguson-Renwick-Benson photometer, which may be shortly designated as the "F. R. B.," are set forth in the following abridgment of notes contributed to the Journal of the Royal Photographic

Society by its three joint originators:

"What are the main requirements in a photometer designed for the purpose of measuring negative densities? They are set out in the title of this communication. The first is accuracy, and the second convenience. With regard to accuracy, there are several different ways in which variations in light-intensity may be measured. I do not, however, propose to discuss their relative merits in this paper, but will content myself with pointing out that a photometer based upon the law of inverse squares is about the only form which can be constructed easily by anyone who is handy with tools. Such an instrument depends simply upon accurate measurements of distance between light-source and illuminated object; therefore, the only points upon which it is necessary to concentrate attention are the desirability of using a light-source which is as nearly as possible a point light-source, or, at any rate, the position of the mass-center of the light must be accurately known, and accuracy in the measurements of its distance and, in addition, sensitiveness of the comparison surface. All photometric work is done by equalizing the brightness of two contiguous illuminated fields, and it is desirable, therefore, that the form of comparison surface which is employed shall be as sensitive as possible. The only other thing is the question of the actual reading of the scale, and it is not difficult by making the scale sufficiently long to ensure that the reading of the scale itself is at least as accurate as the actual adjustment. In adopting the law of inverse squares we have gone to the simplest type of instrument we could. The length of our instrument is such that the divisions are not inconveniently crowded, even at the most constricted part of the scale, and we decided in this instrument to adopt the familiar Lummer-Brodhun optical cube, which furnishes

a very sensitive form of comparator.

"Assuming, therefore, that this instrument can be made very accurately, we may pass to the question of convenience. One point of importance in designing a photometer is that the source of light to be used should be one which is available to the majority of workers. The simplest solution is electricity, provided it can be made available for everybody. In this instrument we have endeavored to make it so, for not only can it be run off the supply mains, but also from accumulators without any difficulty, and if accumulators are not available, primary batteries can be used. It is obvious, I think, that any photometer which employs more than one light source is neither convenient nor reliable for the best work. Here we are employing but one small lamp, of the ordinary motor-car headlight size, but made with a compact, flat, gridiron filament and of about fifteen candlepower.

'We come next to the range of the instrument. This question of range is in most photometers a somewhat serious one. It is very important that the range of the instrument should be not less than two with good luminosity of field. We have arranged our instrument so that one length of the scale gives us 1.8, and by the use of a supplementary density that range can be increased straight away up to 2.8 or more. For by far the greater proportion of ordinary photographic measurements a range of 2.5 to 2.8 is sufficient to cover all requirements. For the purpose of x-ray density measurements, however, that range will have to be increased, and I shall mention later on how it can be done with our form of photometer. There is no difficulty about getting sufficient luminosity up to 2.3 or 2.4, and in any reasonably dark room one can work up to 2.6 or

2.8 with the instrument as it is.
"The next point relating to convenience is that one does not want always to measure small narrow strips of plate. It is a great convenience to be able to take a negative and to measure the density of any part of that plate without cutting it up. A good many photometers have been devised in which it is essential that the piece of the plate to be measured should not be more than one-half inch wide. This leads to the exposure and development of very narrow strips of plate, which is very liable to introduce complications in the shape of irregular development. A good photometer from this standpoint should be able to take, at any rate, a quarter-plate entire. Our instrument does that quite comfortably, and, in fact, a half-plate can be measured at almost all parts without any necessity for cutting it.

"There are one or two practical points to be considered in using any photometer: if you are going to obtain accurate results, it is necessary to go about the work from the beginning in a particular way. For instance, before you begin any experiments in the actual measurement of densities you must first be careful to fix the

position of your zero. You may then find a certain index error, and it is advisable to make four or five, or even more, measurements when starting in order to find out exactly what that index error is. The scale is marked beyond the zero to the right-hand side, so that there may be an actual negative reading, and it may happen that the true zero of the instrument is not at the 0 point, as in the instrument for measuring reflection densities, where the zero point of the lamp in use is 0.03 negative, and therefore that has to

be taken into account.

"Another point to remember is that during the series of measurements one should, if possible, have no alteration in the current supply of the lamp, as any considerable change may affect the accuracy of a series of measurements. It is best to be sure of a regular supply, and if one happens to be working at the time when the main current supply is being changed, it may in some cases lead to some small error owing to the fluctuation. If one is working from accumulators, of course, one is quite safe. In my own instrument I have to work from alternating current, and I have found after many experiences that the best thing to do is to put in a choking coil, for then by altering the position of the iron core one can regulate the current to such an extent as to get the precise amount of light which is most easy to work with. I have tried resistances instead of the choking coil, but with the alternating current the choking coil is the better method of current regulation.

'In working with this instrument the reading taken by moving the mirror from one's right to one's left is generally different from that obtained by moving the mirror from left to right. I have found it best, therefore, to take a series of readings, first working from the left to the right, and then from the right to the left, and if four, five or six readings are taken, and their mean calculated, one has got what is probably an extremely exact reading. When you have worked it out, set your index to the figure found, and after resting the eyes, judge the comparison surface, and if you find it perfectly even, you may be absolutely certain that you have got an exact reading. will illustrate this by an actual case of an uneven series of readings which will show the advantage of the method. The successive readings were as follows: L—R signifying working from left to right, and R-L from right to left:

$$\begin{array}{c} L-R & 1.023 \\ R-L & 1.023 \\ L-R & 1.028 \\ R-L & 1.018 \\ L-R & 1.036 \\ R-L & 1.016 \\ \hline & 6.144 \\ \end{array} \right\} \begin{array}{c} 6.144 \\ \hline 6 \\ \end{array} = 1.024$$

Between some of these readings there may appear to be considerable variation, but if the mean of them be taken it will be found to be about 1.024, and when I had got that particular reading I set the index at it, rested my eyes for a little time; it is best not to shut them, but to look at something very faintly illuminated, and then made an examination and found the comparison screen uniform. Of course, when one has got this figure it still remains to subtract the zero error.

"There is still another question: how far can one rely upon the readings of this instrument? I have made a considerable series of measurements with the instrument demonstrated this evening and from them have calculated by Ostwald's method that the mean error of the instrument was 0.002. It means that one is accurate to about four parts in 1000 with any density, which is about one. Further experiments have convinced me that we can work within these limits when we are used to the instrument. It is probably known to you that, except by the merest accident, no two watches at any given moment register identical readings, probably the watch of each person in this room would give a different reading, and this is equally true of density measurements by different photometers."

Metal for Developing Tanks

The suggestion recently of a correspondent that a substance like vulcanite is necessary for the making of developing tanks is one which we cannot endorse. Vulcanite is really a very unre-liable material, liable to break, to bend and to warp. An ideal material for any developing appliance is the metal known as platinoid, which is said to be silver with a little tungsten added, or it may be described in greater detail as an alloy of copper, zinc, nickel and tungsten. Though rather dearer than brass, it is not a very expensive material, or was not before the war, while it has some most valuable properties, chief among these being great stiffness and rigidity, even in moderately thin sheet form, though easy to cut and work, and complete immunity from the action of developers. It should make perfect racks, and would also make perfect tanks, though the latter might be comparatively expensive. A good tank that will last forever is, however, worth paying for, and our experience of platinoid suggests that nothing better could well be used for both rack and tank. It requires no plating, therefore it cannot be damaged by friction or wear, as a nickel coating can be and frequently is. It is quite rustless, and therefore another source of trouble to tank users is obviated. At present it is probably unobtainable, but it is distinctly a material to be remembered when better times come.—British Journal of Photography.

Photography in Astronomy

To most people the mention of an astronomer brings up the picture of an elderly man gazing steadfastly for long hours through his telescope at the sky. A fine night in an observatory will certainly find the observer with his eye fixed to the eyepiece of his telescope; but it is highly improbable that on a fine night the astronomer will be using the telescope for visual examination. Instead we shall find the astronomer looking through the "finder": that is to say, the auxiliary telescope attached to the main instrument, and used for keeping the great tube pointed at the desired part of the heavens, and for compensating the errors of the driving clock which is designed to keep the telescope pointed at the same star in spite of the rotation of the earth.

If a perfect clock could be made, the astronomer would not need to watch the stars at all.

Nowadays observing is done by means of a photographic plate on which the telescope forms its image; and the only use of the observer is to point the telescope at the requisite part of the sky, and to hold it there, compensating for the small errors which are unavoidable in the mechanism of any clock.

The real work of observation commences after the plates have been developed and dried. The negatives are examined and compared with plates taken at different times. The most important use of the photographic plate in astronomy is in the production and preservation of records of the present positions of the stars for examination in

the future.

One of the most ambitious programs of work that has ever been arranged was the production of the great astrographic chart, or map of all the stars in the sky, on which the observatories of all nations have been engaged for many years. The purpose of this chart is to provide an accurate atlas of the stars as they are at the present time, so that in ages to come their movements can be studied.

The stars appear to move very slowly, but in reality move with great velocity. Many stars are traveling five hundred million miles a year; such a distance is five times as far as from the earth to the sun. The distance of the stars themselves is inconceivably great.

In order to measure the distance of the stars the astronomer has had to invent a special unit. Since the mile is far too small to get any idea of such a distance, the unit taken is the distance which light can travel in a year. Light travels about 186,000 miles in a second: so that in a year a ray of light can travel six thousand billion miles. This vast distance, which is called a "light-year," therefore, is the unit employed in measuring the distance of the stars.

The nearest stars are about eight light-years away: so that we see these stars, not as they are today, but as they were in 1910. These are the the nearest stars; for we know that we are seeing many stars by light which left them a century or more ago; while the light which is reaching us now from the furthest stars of the distance of which we can form any good idea, started before Columbus discovered America. Many stars are at such distances that we are quite unable to

form any accurate idea of them.

With objects at such an enormous distance, even the most tremendous changes take much time to become visible. Eight years ago a new star appeared in the heavens; that is to say its light reached us eight years ago. The star itself may have been formed long before, perhaps by the collision of two large stars; but eight years ago we first saw its light, which had been traveling to us since the formation of the star. That star was in an area of the sky which apparently contains some material, either gas or small particles like those which we see as shooting stars, since there is a little light visible around the new star, and in the last eight years this light has been spreading. Astronomers think that what we see is the light spreading from the new star through space, and lighting up the small particles of matter, which reflect it to us just as the moon reflects the sunlight.

With such vast distances and long periods, mortal man must feel that lfe is not long enough to study the changes which go on in the stellar universe; but by means of photography he can store up his observations of today for the study of future generations of men. So that the discoveries of the future are dependent on the star negatives made by the photographic astronomer

at the present day.

The negatives are made with the greatest care; the photographic materials which are used are specially selected and studied, and as great attention is paid to the photographic observations as to the design and construction of the telescope itself. In order to improve the photographic materials used in astronomy, the Eastman Kodak Co., through its Research Laboratory, is collaborating with many observatories. In this laboratory a skilled astronomer with many years' experience in photographic observation is investigating the properties of different kinds of photographic materials, with a view to suggesting means by which improved materials can be made available for the use of the astronomer. It is not too much to say that astronomers regard such research on photographic materials as of equal importance with their own work on astronomical methods and apparatus.-Dr. C. E. KENNETH MEES, in Australasian Photo-Review.

Hypo-alum Toning

The hypo-alum toning process is becoming increasingly popular among photographers, and deservedly so, as it has been proved to be a most satisfactory method of toning bromide and gaslight prints, being simple to work and giving regularly good results. There is no degradation of the whites, and very little variation in the color if the prints are properly exposed and developed.

Perhaps the only criticism levelled against the process is the tendency to give very cold sepia or purple tones, and in this connection we recently carried out some trials in order to ascertain the best method of producing warm brown tones

regularly.

Differences in the proportion of hypo and alum did not make any material difference, and there was no difference in the final tone of prints that were placed direct into the hot bath and those placed in the cold solution and gradually heated The amount of potassium bromide in the developer appears to influence the color, but in our opinion the final color is mainly influenced by exposure and development. For warm tones the exposure should always be slightly on the over side, and development stopped a little short of the usual time for a black print. A print correctly exposed and fully developed to a good black will invariably give a cold purplish color after toning. What is wanted is a nice balance maintained between exposure and development, and this is an instance where the personal skill and experience of the printer is useful.

To summarize briefly our trials we recommend

the following:

1. The amount of potassium bromide in the developer should be not less than ½ grain to the ounce.

2. Exposure should be slightly on the over side.

3. Development should be stopped just short of full.

4. The old toning bath should be retained and strengthened occasionally with fresh solution.

The ideal print for toning should be slightly greenish in color when it leaves the fixing bath. Very fine tones are obtained on gaslight papers,

the color again being strongly influenced by the

exposure and development.

Many of the large publishing firms are using our cards for hypo-alum toning. It is an exacting process that demands the most perfect adhesion between the paper base, its baryta coating and the emulsion, in order to resist the action of hot solutions.

A suitable fixing bath for prints that are to be

toned in hypo-alum is:

Strong sulphuric acid, 2 drams (fl) in water, 2 ozs.

Add this to sulphite of soda, 2 ozs. in water, 6 ozs.

Pour mixture into hypo, 16 ozs. in water, 48 ozs.

Finally add to above mixture:

Chrome alum 1 oz. Water 8 oz. —From Rajar Trade Notes.

To Prevent Fingers from Getting Stained, Sore or Poisoned

MR. H. M. IMMKE sends us the following:

Take two-thirds white wax or beeswax and about one-third vaseline; melt it together in a tin or other cup. Use no more vaseline than necessary to make it pliable to rub on the fingers. With your little finger dig out a very little and rub it over your finger-nails on both hands; then with both hands rub your fingers to spread it over the ends of the fingers. If printing use a dry rag and wipe your fingers a little so as not to injure the paper should you touch the surface. Repeat the operation when necessary. I have been in business nearly fifty-five years and used this waxing process on my fingers nearly fifty years.

Substitute Sodium Salts

The salts of potassium in this country, even before the war, were less in production than the sodium salts. Enormous imports were necessary to meet the requirements for agricultural purposes alone. But at the present time, incident upon the demands for war requirements, there is a greater scarcity, and the quantity is indeed so limited, and the employment by the Government so urgent, that everyone sees the necessity, not only from conditions, but also from a patriotic motive, to use a substitute whenever possible.

Fortunately, the photographer can comply with the conditions without inconvenience, for the simple reason that for all his needs the substitution of sodium salts for the potassium salts makes no serious difference in the working of

practical formulæ.

It is then really incumbent on him to give up the use of potassium. We might except, however, the permanganate of potash, if its use should be imperative. Besides, the photographer should remember that there is economy in the use of sodium as compared with the enormous advance

of potassium salts.

The greatest saving is perhaps in the use of bromide of soda instead of bromide of potash. particularly as the action is practically identical in the case of both salts; potassium bromide being so necessary for medical use and impera-

tive for certain war purposes also.

Most photographers are conservative, and it is hard to get them to deviate from their old prescribed methods of working, and they fear to give up a formula calling for potassium, lest the results shall not meet expectation. In examining the properties of potassium and sodium salts used in development, we confess there is some difference in action in conjunction with the developing agent. In the employment of pyro, however, there is not a particle of difference observable in the quality of the image evolved, whether we use potash or soda. The only difference is in the more energetic action of the potash salt. The same is the case with the use of hydroquinone, where the action begins more speedily with potash than with soda. But as hydroquinone acts very kindly in conjunction with caustic soda, we may get the same energy as with potash.

It may be of interest to those who have been accustomed to the formulæ calling for potassium carbonate, when called upon to make the substitution, to know how many grains of the different alkaline salts are equivalent; that is, if you are using a certain number of grains of potash, to know how many grains of soda should be used to get the same effect. Here is a little table which shows equal work done by the different alkalies:

Caustic potash . 112 parts Caustic soda 80 parts 165 parts Carbonate of potash Carbonate of soda (dry) 106 parts Carbonate soda (cryst) 286 parts -Bulletin of Photography.

Touching-out Spots on White Mounts

Users of white mounts, whether for photographic purposes or for mounting pictures, have been troubled with unsightly defects in the shape of black or colored spots. This has been much more noticeable in mounts made under war conditions. These defects spoil the whole effect of what otherwise would be a clean white margin. Any attempt to remove them by scraping or cutting away with the retouching knife only makes matters worse, as the spots become much worse under such treatment. The following is a very reliable and easy way of getting rid of the difficulty. Procure a small tube of artists' Chinese white water-color, squeeze a little out on a piece of glass, and work to about the consistency of cream, and then with the point of a clean spotting brush carefully spot the defect until it disappears. If this is done nicely there should be no trace of the spot. It sometimes happens that a defect in the paper of this kind will be found in a bromide print or enlargement; this should be spotted out with the white color in the same way, and when perfectly dry if there is any difference in color, the spot can easily be matched by the retouching pencil or brush.— E. H.

Per Cent. Solutions

In the following table, which has just been published by the Eastman Kodak Company, the number of grains per ounce of liquid required to make a solution of definite "per cent." strength are given. Fractions of a grain are omitted, as they are difficult to weigh, and introduce what in photographic work is an unnecessary refine-

To make a 5 per cent. solution, as an example, 22 grains of the solid are taken, placed in a graduated measure, and water added to make in all 1 fluidounce. To make a 3 per cent. solution, 15 grains are taken and are dissolved to make

1 fluidounce in the same way.

For 1 per cent. take For 5 per cent. take 22 gr. For 10 per cent. take 44 gr. For 20 per cent. take 88 gr. For 30 per cent. take 131 gr. For 40 per cent. take 175 gr. For 50 per cent. take 219 gr.

Carbon Prints on China

THE photographer with a little spare time on his hands might take up china decorating; it is one of the numerous branches of photography that is a source of revenue. Good results can be obtained with ordinary care. Mr. Clarence Ponting gives the following instructions in Focus that will help any photographer giving the process a trial.

There is a certain class of photographer who, having mastered all the known printing processes, is still unsatisfied. The craving is always for something new; something out of the ordinary.

Such a craving has produced the present article on the old and almost forgotten method of decorating china or kindred articles by means of the

carbon process.

The idea of decorating porcelain by this means is probably as old as the carbon process itself, and will be known to every photographer who works the carbon process. They know that the printed tissue will adhere and transfer the image to any flat waterproof surface, but not one in a thousand ever thinks of using any other support than paper—paper of various shades and textures it is true, but nevertheless paper.

This is rather difficult to understand, for the transference of a carbon image to any smooth china surface presents very little more trouble than the method adopted for paper prints, and the results certainly repay one for the slight extra care expended upon the production of the

finished article.

One hears a great deal about the juicy appearance of a carbon print and of the liquid appearance of the shadow portions, and yet upon examination of a number of black carbon prints in comparison with prints on any of the carbon surface bromide papers it would take an expert to determine which were the bromide prints and wherein lay the superiority of the carbons. It is only when the carbon image is transferred to a surface such as fine porcelain or ivory that the true beauty of the carbon process becomes apparent.

Such a print cannot be equalled by any other known process, with perhaps the single exception of the ceramic process. In fact, a carbon print on a good piece of china presents the same appearance as a well-executed ceramic, obtained with

considerably less trouble.

Plates decorated by the process may have the image destroyed by being scratched by some sharp instrument, but washing them when soiled or dusty will not harm them. When cleaning plates decorated in this manner, the washing should never be vigorous, neither should a brush be used, otherwise damage will result. The merest wipe with a soft, damped rag will at once remove dust and dirt.

With this exception, articles decorated by the carbon process are as permanent and as beautiful as those made by the ceramic process. On account of the possibility of damage through scratching or other abrasion, articles of daily use should not be decorated by means of this process. The articles treated should only be those intended for decorative purposes and not for utility.

The most suitable articles for decoration are undoubtedly plates or plaques, although small cups and saucers, tobacco jars, vases, and kin-

dred articles are very effective.

One should be careful when purchasing china for decorative purposes to see that it is of good quality, is free from sand particles, is plain white or cream colored, or if tinted with a color, the tint should be very light, and finally the surface must be even.

It is not necessary to have a flat surface, provided that the surface is even. As an instance, take a teacup. This is not a flat surface, but is quite easy to decorate, provided it has an even surface and not fluted. A fluted article or one with projections cannot be decorated in this manner.

The Carbon Tissue

The tissue is the ordinary variety sold for print-making. It may be purchased ready sensitized or in an insensitive condition. Perhaps the latter is preferable, as one can then sensitize the tissue to the requirements of the negative. Tissue which is purchased ready sensitized gives rather flat effects, and it will be found advisable to sensitize the tissue to give a vigorous effect, for decorated articles are not generally viewed as closely as prints.

To sensitize the tissue to give this result, the usual bath should be employed, but instead of leaving the tissue to soak for three minutes, curtail the time to one minute. Carbon tissue so sensitized becomes of the same rapidity as gelatin P. O. P., which makes the timing of the printing a simple matter. Prints which are to be used for decorative purposes should be correctly printed, never over-printed, even erring on the side of underprinting rather than the reverse. Over-printed pictures have a tendency to frill during the developing operations.

Preparing the China Articles

In order that the carbon picture may adhere to the china support, it is absolutely necessary that the porcelain be thoroughly cleaned. Every

trace of grease and dirt must be removed, and even hot water sometimes proves insufficient as a cleanser, with the result that the picture frills, or even, in extreme cases, entirely leaves the sup-port. The best way to clean the plate thoroughly is to wash well in hot soap and water, and then well rub with a cloth wetted with strong liquor ammonia of .880 specific gravity. will make the plate quite clean and in a condition to receive the reversed carbon picture. If one wishes to be quite certain that the picture will adhere to the plate without the least possibility of frilling, a gelatin substratum may be prepared as follows and applied with a brush: Place ½ oz. of gelatin in cold water and allow it to soak for three hours. At the end of this period pour off the water. Add 1 oz. of boiling water in which is dissolved 10 grains of potassium bichromate. This will melt most of the gelatin, and any which remains undissolved may be made liquid by the application of gentle heat. The best way is to pour the partly dissolved gelatin into a tumbler, which should be then stood in a bowl of boiling water until the gelatin is all dissolved. To apply this solution, first warm the plate until it is quite warm to the touch. Then apply the gelatin solution with a camel's-hair brush, coating a larger area than is required for the finished picture. Finally, place in a warm cupboard to dry. When dry, expose the coated portions to sunlight for one hour, which will have the effect of making The carbon the substratum quite insoluble. pictures may then be transferred to the coated portions without the slightest fear of frilling.

If, however, the plate is thoroughly cleaned with ammonia, there should be no necessity for

the use of the gelatin substratum.

Transferring the Picture

Pictures made for decorative purposes must have been safe-edged. As a mask will be generally used, this, of course, acts as the safe-edge, and it might here be stated that it is impossible to cut out a piece of tissue successfully the shape required, print it without a mask, and expect it to transfer to the piece of china. Such a procedure means frilling to an alarming degree, and courts failure.

The correct way is to determine first the shape of the picture to be transferred. If it is a cup that we wish to decorate, an oval mask is generally the most suitable; or, if the center of a plate or plaque is to be treated, a circular one will generate.

ally give the best results.

To find the size of mask required, a pair of compasses proves useful. Find the center of the plate—measure the exact size of the circle with the compasses. Now make this circle on a piece of black or red paper, and carefully cut the mask with a pair of scissors. Next take the piece of carbon tissue, and on the back again inscribe the circle with the compasses. Then cut out the circle of tissue, not on the line given by the compasses, but about one-sixteenth of an inch larger all round, taking the line drawn by the compasses as the guide. If one cares, the compasses may be opened one-sixteenth of an inch and the carbon tissue cut on the line thus obtained. Whichever method is employed, the result will be a piece of

carbon tissue circular in shape, but one-sixteenth of an inch larger all round than the mask we have cut. This is to allow a sufficient portion to be safe-edged by the mask. Now place mask and tissue in position in the printing frame and place

out to print. Do not overprint.

Having printed the tissue, have ready a large tin bowl filled with water at a temperature of about 50° F. At the bottom of this bowl place the article to be decorated, with the side to be decorated uppermost. Then plunge the tissue beneath the water, and note its appearance. At first it will curl inward, and after a short period will begin to straighten itself. This is the stage at which the transferring must take place. At the first sign of the straightening process bring the carbon tissue in contact with the china, this being done under water. Then gently bring the two in contact to a flat surface such as a table top, and gently press out the surplus water with a dry cloth rolled in the shape of a pad. A squeegee cannot be employed, but if the cloth is used with a rubbing motion the tissue will adhere without any trouble. The plate may now be placed aside for fifteen minutes. In the meantime, pour off the cold water from the bowl and fill up with water at a temperature of 120° F. After the fifteen minutes have elapsed, place the plate with the adhering tissue face upward into the bowl of hot water and allow at least a minute to elapse before attempting to remove the tissue. This should be done carefully, as the safe-edge is very small, and unless care is exercised one may pull up part of the picture, and so cause frilling. The best way is to take a pin and carefully pick up the edge where the pigment appears to exude more than at other parts, as it will be soluble. Having lifted this portion, remove the tissue with a steady pull, and the transferring operation will be completed. The image now only requires to be developed. This should be done automatically, as it renders the fine details better than the usual laving methods commonly used by carbon printers.

This is done by turning the plate over in the water in such a manner that the picture side is facing the bottom of the dish. In this position it will develop automatically in about ten minutes, the water being kept at a constant temperature by means of a gas stove. When development is complete, pour over the plate a solution of alum 1 oz., water 20 oz., which will harden the gelatin film. Then wash under the tap for five minutes to remove the surplus alum, and place away to dry. The drying should not take more than three hours, as carbon prints on china dry considerably quicker than prints made by the

same process on paper.

When the image is dry, the article is to all intents and purposes complete. It can be easily damaged by moisture or abrasion when in this condition. Two coats of proof varnish will make the image impervious to damp and light scratches. When varnished in this way, the plate may be lightly sponged with cold water if it becomes dirty without in any way affecting the image.

I believe that this varnish is composed largely

I believe that this varnish is composed largely of celluloid in solution, so that the print is really protected by an extremely thin film of celluloid. For similar articles, the writer has seen "hard varnish" recommended, but has not tried it. Probably it would take a few days to dry, and could not possibly beat the acid-proof varnish, which dries in an hour.

The articles are then ready for the cabinet, or, in the case of plates, may be fitted with hangers costing a penny each, and hung up for decoration.

A final hint to those who intend to try this process is always use freshly sensitized tissue, as the safe-edge will then leave no trace on the china. If stale tissue is used, the safe-edge will leave a ring of discolored tissue. This may be removed with a camel's-hair brush while the print is wet, but care must be employed.

Amidol for Development Papers

Are you interested in innovations, and do you desire to keep abreast of the times? If so, I will take the liberty to acquaint you with a few facts.

Most photographers do not remember or do not know of the old albumen days, accompanied by difficulties and disappointments, when the photographer was compelled to get up before sunrise to silver and fume his paper for a day's work. If it clouded up and rained, there were time, patience, and money lost. What a boon to the photographer was the advent of the ready-prepared chloride papers!

Still, in those days there were people in ruts just as at the present time who could not immediately see the advantage of these papers, or were skeptical, with the result that they lagged behind those who at once realized their advantages.

History is repeating itself, for the lagbehinds of today do not realize the advantages of the newer wash—chloride developing papers. These papers are now on the market with the principal objection overcome, viz., an even coating of emulsion and uniformity of speed. Furthermore, the surfaces are such as to give all sorts of effects, including an approximation of carbon and platino type. Blue-black, black, gray-black, brownblack and sepia tints are obtained by varying the strength of the developer and length of time in the fixing bath with alum.

How these papers simplify things! You do not have to depend upon Old Sol. Three hundred prints can be obtained (by hand) in a day. An enormous amount of time is saved, and last, but not least, no gold or platinum is used. Most of the papers on the market today are good, but what surprises me is that so little attention is given to the developer. It seems that those who are using these papers are satisfied with metolhydroquinone, not realizing that more brilliant results than they are getting can be obtained with other developing agents.

I have tested these papers with every developer on the market and find that with amidol, and used with my own formula, results are obtained as with no other formula or developer. I make up a stock solution of

Water				40 oz.
Sodium sulphite (cryst)				2 oz.
For use take of—				
Above stock solution				10 oz.
Amidol, dry				40 gr.
10 per cent. solution b	oror	nid	e	
of potash		5 t	0	10 drops

If I have not my weights handy, I use a fairly new ten-cent piece to weigh my amidol. This gives me exactly thirty-eight grains. grains of amidol will produce a blue-black. This can be modified to a gray-black by using less amidol. I sometimes use bromide papers for contact printing and find the amidol gives me the same rich, brilliant effects, but I take only thirty grains to the above formula.

Finishing Carbon Prints without Subsequent Mounting

ONE of the most effective and simple methods of treating carbon prints is to print under a mask of suitable shape and transfer to support of sufficient size to leave an agreeable margin.

This effectually dispenses with the bugbear of mounting, and if done well the result is often a great deal more pleasing than if a quire or two

of grocer's bag paper were used.

There is a great deal more scope for the author's taste than might at first be imagined. This taste can chiefly be shown in the selection of the support and the position of the image thereon, but there is also room for ingenuity in the choice of hand-work on the margin of the

finished print.

In respect of paper for base we are far in advance of the non-carbon worker, who even if he print with margins mus either trim and mount in the usual way or stick to the original paper stock. Also, it is much cheaper to print say on a half-plate piece of tissue and transfer to 12 by 10 support than to print direct on to a 12 by 10 piece of sensitive paper. There is, of course, the disadvantage that we are practically forced to use the single transfer process, but this is more apparent than real, for the number of cases when reversal matters is very much less than is generally thought.

For the support we have choice of etching, different makes of drawing and variously tinted crayon papers. Those who wish to coat a special paper will not find it difficult.

Pin paper to drawing board or other flat surface and coat with the following solution:

Nelson's No. 1 gelatin . . . 1 oz. Water 1 pint

Soak gelatin for two or three hours in cold water and then dissolve by gentle heat, when dissolved add

This must be poured in very gradually, stirring the while. Filter and apply with broad camel's-hair brush. Two coats should be given; when dry proceed as usual. As the treatment is alike for all rough single transfer papers (double transfer is as usual when printing for subsequent mounting), it will suffice if we describe the procedure with the useful etching paper. This paper can be obtained both toned (i. e., buff) and white. The toned etching gives a very fine effect when used with red or sepia tissue.

As it is somewhat difficult to place tissue correctly on support, it is as well to make three marks corresponding to the corners of tissue

either by pricking or with a pencil. In any case the back should be marked, as it is almost impossible to recognize the proper side of the prepared paper when it is wet. Even when dry it is not easy. Coated side of ready prepared papers is usually the roughest. At times there are shining

specks in places.

The great thing to remember with these rough papers is, that the support must be made pliable enough to squeeze into absolute contact with tissue. This pliability is somewhat hard to obtain. The paper must be soaked in cold water for two or more hours, and then placed for at least half an hour in hot water. After this treatment the paper should be soft enough to allow of the little hollows on the surface being forced into contact with the pigmented paper if fairly heavy

pressure is used on the squeegee.

The sensitized tissue is printed in the usual way, using an opaque paper mask instead of a safe edge. When the single transfer paper is ready, immerse tissue in cold water until it begins to uncurl, then place on support. Support should be laid upon a flat surface and flooded with cold water. To avoid air-bubbles as far as possible take tissue by opposite corners, raise hands and bend paper along the diagonal. Withdraw from water and place corner in position on one of the marks, lower other corner on to correct mark, and drop the hands until both surfaces are in contact. Now use the squeegee, which should be of the straight-edge pattern, with some force, sweeping from center of print outward.

After a few strokes place between dry blotters, under a weight, leaving for at least thirty minutes

before developing.

With these papers development should not be hurried by using too hot water, as the pigmented gelatin is even more liable to blister than usual. About 99° will be quite hot enough.

If tissue had been under-exposed, soak for a longer period in warm water rather than raise the temperature of bath. Development should be complete in about five minutes—that is to say print stops bleeding.

When developed place picture in cold water to set the ge'atin. To ensure permanency the

print should be placed in

Alum 1 oz. Water 1 pint

But I do not invariably do this, as the yellow bichromate stain is very pleasing with some subjects. If alum is used prints are to be washed in running water for thirty minutes and then dried. You should now have a print which, if the tissue was squeegeed in correct position, requires no further treatment. Usually, however, it will be necessary to trim a little to get the sides of the subject and those of the mount parallel.

If the print appears to you to be too plain, a line drawn parallel to and at any distance from the print will give a good finish. Half an inch from print is a good distance. The line is easily made of any thickness by using a ruling pen. A set square is the best guide. Be very careful with the corners. A black line with Indian ink suits most things. Variously colored inks can be obtained, which will either harmonize or contrast with the print.

A double or even a triple line can sometimes be used with advantage, but beware of too much

elaboration.

The title and author's name or hieroglyphic must invariably be of the same colored ink as line. The placing of these adjuncts has some bearing on the ultimate appearance of the whole, so should not be printed in without due thought.

If suitable margins are left and the lines are drawn neatly, the result should put to shame many of the multiple paper monstrosities.

This method of mounting on to thick support

is capable of many variations.

It has been a surprise to me that carbon picture postcards are so little used. When done on etching paper cut to size the appearance is very fine, and a great relief from the ordinary bromide or worse P. O. P. cards.

The making of Christmas cards and calendars also comes to mind as suitable for this treatment, the print being directly on the support seems to

be more in keeping with the idea.

Any mottoes or tables are easily written on the paper.

Helping Faulty Negatives

Although there is no lack, either of reliable plates and films for every conceivable purpose, or of information concerning their proper exposure and development, the personal factor, which should control and harmonize all other factors, introduces so many variations that good negatives are by no means as common as they should be. Thus, if we look over our negatives, together with a set of prints from them, we will find few that are really satisfactory, judging them by the prints they give-for which purpose they were made. In the majority we will see that by personal error, in the choice of the plate, in exposure, in development, or some other detail normal conditions were upset, and a good negative was made impossible of attainment by normal processes. Here we see a negative full of detail, but weak or thin in opacity. The contrasts are so weak that it will give only soft, flat prints without force or brilliancy. The errors here were over-exposure and under-development. The remedy is intensification, the strengthening or intensifying of the opacity or contrasts of the negative. In another negative the image has over-much density, with excessive contrast. The exposure was a trifle short and the development unduly prolonged, or a developer was used which gave density more rapidly than detail. remedy here indicated is reduction, the weakening or reducing of the opacity and contrasts in the negative. These are extreme cases. In some negatives we require a little more, or a little less, force in the foreground; or we have a seascape in which the sky and clouds are buried in excessive density. Local intensification or reduction are here suggested. Or it may be that we desire to change the character of a negative, or to modify part of it, to adapt it to a new printing paper, or to secure certain effects. Hence arises the neces-sity of being familiar with the various methods available by which a negative, already developed and fixed, may be so changed or modified as to yield more satisfactory prints than could be

obtained from it in its original condition, or to save a negative otherwise useless.

In almost all intensification and reduction processes it is essential to success that the negative under manipulation shall be free from hypo, chemical stains, grease, varnish, or other agent in the film which can in any way interfere with the uniform action of the intensifier or reducer employed. The more care we take to ensure that our intensifier or reducer is working upon a simple image of silver in gelatin, the better will we succeed.

The greater part of the failures, stains, fog, streaks, and other troubles encountered in intensifying or reducing negatives, have their origin in lack of carefulness at the start, and the importance of the thorough preparation of the negative cannot be urged too strongly. When about to intensify or reduce a negative, therefore, first remove all varnish (if it has been varnished) and grease or dirt from the film. If there is any uncertainty as to whether the negative was properly fixed, it is advisable to soak it in water for a few minutes to soften the film, and then refix it as a precautionary measure in a freshlymixed fixing solution. For the reader's convenience formulæ are here inserted. Plain Fixing Bath: Dissolve 1 pound of hyposoda in 2 quarts of water; or, 4 ounces of hypo in a pint of water, according to the bulk of solution needed. An acid fixing bath is preferred by many workers as hardening the gelatin film and clearing the shadows of the negative better than a plain hyposolution. I have used Acid Fixing Bath with great content, as follows: Sulphuric acid, 1 dram; hyposulphite of soda, 16 ounces; sulphite of soda, 2 ounces; chrome alum, 1 ounce; warm water, 64 ounces. To prepare this bath conveniently (it will serve the ordinary amateur's needs for a full year), put 48 ounces of warm water into a large bottle, such as those in which mineralwaters for table-use are sold, and add the hyposulphite of soda; dissolve the sulphite of soda in 6 ounces of warm water; mix the sulphuric acid with 2 ounces of water and pour slowly into the sulphite solution, after which add to the hypo-sulphite solution in the large bottle. Now dissolve the chrome alum in 8 ounces of water, and add it to the bulk of the solution, and the bath is ready for use. Fix or refix the negative in this bath by immersing it for fully fifteen minutes, then wash for half an hour in running water to clear away the hypo in the film. After the negative is well washed, swab it carefully with a wad of cotton to remove any deposit left by the washing water, and place in a tray containing distilled or cold boiled water until ready for intensifica-

In several methods, such as in mercurial intensification, it is absolutely necessary that the negative film be wholly free from any trace of hypo, or stains will result, to the utter ruin of the negative. The best hypo eliminator is careful washing in a stream of running water, but there are commercial preparations which are said to do the work with greater certainty.

It is also desirable that negatives which are to be intensified should be, as far as is possible, free from fog or stain caused by prolonged development. Such discolorations may be removed by the use of a clearing bath. A reliable formula is given by Hauff, as follows: Thiocarbamide, 300 grains; citric acid, 150 grains; water, 1 quart The negative is immersed in this after the usual fixing and washing. When thoroughly cleared, it should be again washed for a short time. Another good clearing bath for removing general fog or yellowness from negatives is as follows: Pulverized alum, 55 grains; water, 20 ounces; to this add, slowly, sulphuric acid, 1 dram.

Iridescent stains or markings on a negative are sometimes the result of overmuch saturated solution, 5 ounces; common salt, $\frac{1}{4}$ ounce. Wash well, and blacken in ammonium sulphide, 1 ounce; water, 10 ounces. This solution has a powerful and unpleasant smell, hence it should

be used near an open window.

It may be here mentioned that the stains which at times result from mercurial intensification can be removed, it is claimed, by washing the plate for a few minutes, and then immersing it in a 10 per cent. solution of ammonium sulphide, but

this is a doubtful remedy.

If instead of blackening the bleached image with ammonia, we use sulphite of soda, the silver chloride is dissolved as before, and we get an image composed of black metallic mercury. As commonly used, an equal amount of potassium bromide is usually added to the bleaching solution, making it practically a mercuric bromide solution. The image so obtained is less intense than that given by ammonia, but an advan-tage of the method is that there is less necessity for prolonged washing between bleaching and blackening the plate. I give a typical formula. Bleaching Solution: Mercuric chloride, 1 ounce; potassium bromide, 1 ounce; water, 40 ounces. When the image is bleached, rinse the plate in water to thoroughly remove the mercury, and immerse it in the Blackening Solution: Sulphite of soda, 1 ounce; water to make 10 ounces. When intensity is reached, wash the plate and dry as usual. If the sulphite fails to do its work, the cause is probably alkalinity of the solution. Add a few drops of citric or sulphuric acid. Although a patented preparation, the Agfa

Although a patented preparation, the Agja 1-solution intensifier recently introduced possesses sufficient general interest to be mentioned here. It is based on the use of double salts of sulpho-cyanide of mercury and an alkali metal, and comes in the form of a concentrated solution, 1 part of which is diluted with 9 times its bulk of water for use. Negatives, duly fixed and washed, are immersed in this dilute solution, and gradually darken with a grayish black deposit of greater intensity than that given by the mercuric bromide and sulphite method. The action is somewhat slow, which is advantageous. When the desired density is gained, the plate is washed for ten or fifteen minutes, and dried. The advantages of the single solution, without necessity of using the preliminary bleaching solution, will

Sketch-portraits: A Method of Direct Work on the Original Negative

be obvious.

The sketch-portrait, in which the essential part of the image, namely, the head and face, and possibly the arms and hands, is reproduced

in tone by the direct impression of the negative, and all the rest is worked in line in the form of a sketch more or less detailed, is the subject of an article by M. Jacques Béryl in the *Photo-Revue*. There are two distinct methods of making these sketch-portraits. In one of them the original negative is directly utilized; the other requires the draughtsman's work on the positive print or on an enlargement. The first method, of course, allows of as much multiplication of prints as one may desire, whereas the second is limited to the one example, and is only to be duplicated by re-copying. The author confines himself in this article to the sketch-portrait as executed on the original negative. The first essential, having chosen the subject with this express object in view, is to employ a proper background, which shall be as far as possible uniform and of black or at least of dark tone. No kind of background is ruled out, whether it be interior, landscape, or foliage; but to have a background of uniform pattern and dark is preferable, in that it simplifies the work of drawing, which represents for most photographers the principal difficulty in procedure. A background which in the negative is light and even will make it possible to follow more easily the contours of the parts which are to be worked in.

The glass side of the negative is covered with a layer of varnish, of red or other non-actinic color. The coloration must be sufficiently deep to obscure the impression of the parts it is desired to keep covered, both when viewed by daylight and by artificial light of a certain intensity. Then with the point of a pen-knife well sharpened, one removes the colored varnish covering the head and other parts of the subject which it is desired to leave in half-tone. The drawing of the accessories which are to be translated in line is obtained by tracing the knife point through the varnish in such a manner as to get furrows of clear glass; these correspond to the outlines of the dress and of whatever it may be desired to include in the sketch. For this purpose the negative is placed upon an inclined glass plane, such as the desk commonly used for retouching. When a certain stage in these manipulations has been reached it is as well to make a trial print in order to take account of the progress which has been made and of the modifications it may be desirable to introduce in completing the work.

Many varnishes fulfil the required conditions of opacity and flexibility necessary to give a clear line, firm and without raggedness. One may be content, in the absence of anything better, to add to a colorless matt varnish of commerce a tinctorial substance from aniline or vegetable colorings, provided that it is soluble in alcohol or in any other vehicle adopted for solubilizing the resinous elements. The following preparation

may also be employed:

This varnish, after being decanted and filtered, is tinted a deep red by the addition of an appropriate coloring matter, as, for example, fuscin in

alcohol solution, etc. One may find satisfaction also in ordinary collodion, with the addition of 2 to 3 gm. of chrysoidine per 100 c.c., but the drying of this collodion in a layer sufficiently dense and homogeneous is not always successful unless it is preceded by the albumenizing of the

glass.

Of the technical execution of the drawing with the knife point, the author says nothing. That is a matter for the skill and taste of the worker. It is principally on the cleverness of the artist that the perfection and delicacy of the rendering will depend. The furrows traced in the colored varnish with which the reverse side of the negative is plastered are, of course, impressed as black or dark lines in the positive print. He finds it more easy to operate on a negative developed to a gray black than on a negative carried to an extreme black, and with the object of obtaining a suitably developed negative he uses amidol developer with the addition of boric acid, about 2 grains to each ounce of the solution. If, in spite of the addition of boric acid, the negatives are still too dense, the proportion of water may be increased, even to doubling, and the boric acid increased in a corresponding proportion. It goes without saying that the worker must be capable of making at will a negative soft and detailed.

The Action of Various Reducing Agents

THE brothers Lumière favor us with a copy of their recent paper communicated to the French Photographic Society, wherein they detailed their experiments on the action of the persulphate reducer, as compared with other oxidizing reducers; for example, peroxide of hydrogen, permanganate of potassium acidulated with sulphuric acid, and bichromate of potassium acidulated with sulphuric acid. Trial negatives were made by exposing a plate in stripes or bands, so as to obtain degrees of density having a relation to the exposures. Pieces were now cut from this plate across the bands and treated with the various reducing agents. The authors conclude that persulphate of ammonium is the only reducer which can be used in actual practice for reducing a negative without attacking the fainter gradations. In addition, the Lumière brothers have made the following observations: (1) Persulphate of ammonium solution acts more rapidly when the negative is wet than when it is dry. (2) The action does not commence immediately, but when once commenced it progresses regularly.
(3) Negatives weakened to the required degree by means of ammonium persuphate should be immediately immersed in a bath calculated to destroy the superabundant compound, as, for example, a solution of an alkaline sulphite. spite of this precaution the reducing action continues after withdrawal from the persulphate bath. (4) Whatever be the concentration of the ammonium persulphate solution, the ratio of reduction is the same for the various parts of the subject. (5) Fog, due to over-exposure, is not removed or appreciably reduced by the ammonium persulphate reducer.

Sodium Bromide

In the following letter, Johnson & Sons, writing to the editor of *Photography*, point out

that sodium bromide can be substituted for potassium bromide in almost all photographic uses for the latter salt. As sodium bromide is listed at about half the price of the potassium salt and is much more readily obtainable at the present time, the advantage of following the suggestion is obvious

gestion is obvious.

"SIR: You are doubtless aware that the potassium salts are used very largely in munition work and are under control. They are therefore becoming more and more difficult to obtain. As sodium bromide is perfectly suitable for the photographic purposes for which potassium bromide is used, it seems to us to be the correct thing, and of national importance, for photographers to be asked to adopt it.

"We have made tests in our own dark rooms with various makes of bromide paper, and can confidently assert that, when using in the bleaching bath sodium bromide instead of potassium bromide, there is no difference whatever in the

resulting tone.

"As regards its use as a restrainer: here again the same quantity of the sodium bromide can be

substituted for potassium bromide.

"We are quite sure that if your readers who are using potassium bromide, either as a restraining agent or as one of the bleaching chemicals in the sulphide process, will decide to use the sodium salt, it will make no considerable difference, and will be reserving the potassium for much more important and necessary work.

"One of the standard formulæ for toning, but with sodium instead of potassium bromide, is the

following:

"Bleaching Bath. Potassium ferricyanide, 1 ounce; sodium bromide, 1 ounce; water, 20 ounces. For use, 1 ounce of the solution is diluted with 3 ounces of water.

"Toning Bath. Sodium sulphide, pure, $\frac{1}{2}$ ounce; water, 25 ounces. For use, 1 ounce of the

solution is diluted with 3 ounces of water.

Yours, etc.,
Johnson & Sons, Manufacturing Chemists,
Ltd."

Mounting with Adhesive Applied Only to the Edges

Mounting is an operation in which there is great risk of spoiling an otherwise good print. I do not write of dry mounting, which, when the necessary apparatus is available, seems to be as near perfection as anything can be got; but of mounting as it has to be carried out with the means which are at the disposal of the average amateur photographer. These generally reduce themselves to a pot of starch paste or some ready made adhesive, a brush, and some sheets of newspaper.

The difficulty which most of us experience lies in the apparent necessity for applying the paste over the whole of the print. To get this to be quite flat, not only must it be pasted all over, but sufficient time must be given for the paper to absorb moisture from the mountant and become limp. The result is that as it dries it contracts, and causes the mount to curl. Drying under pressure and drying with the mounted print bent into a convex form, print outward, have been suggested as methods which get over this incon-

venience; but at the best they are not very successful, for if the mounted print is left lying

loose afterward it soon curls again.

An alternative is to apply the mountant at the edges only. It is not at all difficult to do this neatly, and it at once gets over the cockling trouble. The greater part of the print being quite dry when it is mounted, there is no contraction with its inevitable bending. Even the edges which are pasted need not be very limp. I have mounted all my prints in this way for several years now and should be sorry to have to go back to the paste-all-over method again.

The mountant used may be one of the pastes which are especially made for photographic purposes—there seems to be very little to choose between them, and I buy whichever happens to be in stock. They are better than home-made starch paste, as they contain less moisture than

A stencil-brush—a round brush with very stiff short bristles in a metal holder-is best for applying the adhesive, although at a pinch this can be done with the finger tips. The necessity for wiping them clean each time prolongs the operation, however, and is wasteful of mountant. I tack a big button flat on the end of the brush so that it will stand firmly, bristles upward, when it is not actually in use.

For mounting prints that are all approximately the same size, a piece of zinc or tin plate a quarter of an inch smaller each way is very handy; it should have a strip bent and soldered to one side of it like the handle on the lid of a saucepan. When the prints vary very much in size, a piece of newspaper may be cut for each to answer the

same purpose.

To mount a print it is placed face downward on a pile of clean newspapers or similar material. The metal plate, or the paper, is put on it, so that an equal width of print extends beyond it all around, and a thin but even coating of the mountant is given with the brush to this margin all round. The brush should be moved lengthwise in the direction of the margin, but slightly outward all the time to make sure that none of the mountant gets under the edges. As soon as the mountant is applied all round, the plate or paper is taken off, the print raised, put down on its mount, lightly rubbed into contact, and put away under pressure to dry. I usually shut it up in a book. The top piece of paper is then removed from the pile and thrown away, and another print put in hand.

If the precaution is taken of having prints and mounts normally dry before mounting them, which will be the case if they are spread out in the room for half an hour or so previously, they will not only be flat when removed from the pressure, but they will remain flat afterward.—Professional

Photographer.

A New Method of Intensifying Carbon Lantern Slides and Transparencies

In normal times the approach of the lantern season means to most of us a repeat order for our usual brand of lantern plates without further consideration, but war conditions may, at the moment, induce many slide makers to try other

processes than those involving the use of dry plates. Among these carbon should be a prime favorite. Indeed, the paragraph referred to came to me very opportunely, for it served to remind me of a roll of platinum black carbon tissue which I had purchased ten years ago and never used, and which I immediately decided to bring

into requisition.

I recognized, however, that it was inadvisable to attempt direct carbon work with negatives of a character suitable only for contact printing on gaslight paper, and many of mine required the vigorous brand of that useful commodity in order to get a good print from them. I decided, therefore, to use ozobrome, and make my slides from gaslight prints. The resulting slides by this process are, of course, carbon slides as much as if made by direct printing.

It took me some time to get into the working of the platinum black tissue, which was not specially made for the ozobrome process; but when I had once succeeded, I was able to produce slide after slide, beautiful in detail and correct in gradation. But from many of my negatives I could not get that depth in the shadows, combined with brilliance in the high lights, which is desirable in a lantern slide.

With a bromide of silver lantern plate I should have put the slides right at once by intensification; but with carbon slides there appeared to

be no practical method available.

On reference to text-books I found the only thing recommended was potassium permanganate, which, while it stains the image a pleasing brown, certainly does not add much to its

It then occurred to me that in a carbon slidethe support being practically almost bare glass, and the quantity of gelatin strictly proportionate to the image throughout—it ought to be possible to intensify by simply impregnating the gelatin with some chemical in solution which the gelatin would absorb, and then, after rinsing off surface solution, following with a bath of some other chemical in solution which, reacting with the first, would cause the deposit of a precipitate in the The amount of chemical absorbed by the substratum, provided this was simply the usual substratum employed, would be so slight as not to affect the brilliance of the whole.

A few rough experiments soon confirmed my supposition, and I obtained results which surpassed anything I had anticipated.

I took a solution of about 2 grains of green vitriol (iron sulphate) in 1 ounce of water, and placed in this a dry slide which had been previously put through an alum bath in the usual way to fix the gelatin. In about two minutes the slide was taken out of the iron solution, rinsed in a basin of water for from two to three seconds, and placed in a freshly prepared solution of barium sulphide. In this it was allowed to remain until all action had stopped, the time depending on the strength of the sulphide solution. The surface was gone over with a tuft of cotton wool, and the slide washed. The result was a great increase in the strength of the slide, which showed strong and rich shadows, combined with brilliant high-lights, and an extremely good black similar to that of a photogravure.

It is quite possible, however, that the intensification may be greater than needed unless the iron bath be weaker than stated. Should this over-intensification occur, it is simply necessary to treat the slide, after washing out the sulphide solution, with very dilute hydrochloric acid, of which 5 minims of strong acid to the ounce of water should be ample. As an alternative we may use a few grains of oxalic acid to the ounce of water. A slight rub over the surface of the slide with either of these acid solutions in a still more dilute state will act as a clearing bath; while if allowed to act fully, either acid will quickly remove the whole of the added density, and restore the slide absolutely to its original condition.

For my next experiment I took about 2 grains of sugar of lead (lead acetate) to the ounce of water, and proceeded exactly the same as with the iron solution. The first effect with lead is a precipitation of lead sulphate in the image due to the presence of alum in the gelatin. This is immaterial, but serves to fix the lead. The slide is then rinsed and placed in the sulphide bath, in which it gradually changes to a rich warm brown, and gains a degree of intensification depending on the strength of the lead acetate solution, and the amount of lead absorbed. The intensification with lead can be removed, either partially or completely, by means of acidified permanganate applied after the sulphide solution has been washed out. This, of course, must not be so strong as one would use for reducing a negative. A start should be made with a very dilute solution, and the strength should not be increased more than necessary, in order to avoid risk of injury to the carbon image. After the permanganate there will remain a residue of white lead sulphate which is easily got rid of by means of

In regard to silver I have not found that silver nitrate solution is readily absorbed, unless the slide is first soaked in a solution of about ten minims of hydrochloric acid to the ounce of water. After this acid bath the slide may be rinsed, and painted over with silver nitrate solution. There is, however, probability of brush marks if this method is adopted. The slide must then be rinsed and its surface wiped before placing it in the barium sulphide solution. Should the intensification be too great or the high-lights tinted, a very weak solution of permanganate acidified with sulphuric acid will clear the slide, and the same solution may be used to remove the intensification, either partially or completely. Silver does not appear to possess any advantage over lead except that silver sulphide is known to be permanent, while lead sulphide in a slide may prove to be not quite

An extremely warm brown color and a moderate degree of intensification may be obtained by first treating a slide with a solution of uranium nitrate in water, and after a momentary rinse placing it in a 10 per cent. solution of potassium ferrocyanide. It is important to note that this is the yellow prussiate, and not the red prussiate or potassium ferricyanide, which latter has no action in this case. If a first application is insufficient, the slide may be returned to the uranium

nitrate. The slide also may be cleared by aftertreatment with dilute acidified permanganate.

There are undoubtedly many other applications of this method of combined toning and intensifying carbon slides and transparencies which will be extremely interesting; but it may be well now to summarize a few of the little details which must be attended to during the manipulations. In the first place some little attention must be given to the slides while in the alum bath, as, in the case of lead intensification at any rate, the alum must be uniformly distributed in the side. Then, a slide when placed in the metallic solution must be uniformly dry, otherwise it would not take up the metallic salt evenly. The dish must be rocked, and the surface uniformly wetted. The strength of the solution, and the time required for its absorption must be found by experiment. It may differ slightly in each case.

It is quite possible that an old and very much hardened slide may resist a solution which a fresh slide would absorb readily. In this connection it is well to remember that soaking in dilute hydrochloric or acetic acid would tend to soften the gelatin of a hard slide. For this reason acids and alkalies must only be used in a very dilute state. My first experiments were made with sodium sulphide, which almost invariably caused frilling and blistering. With the barium compound I have not had any trouble at all. While in the sulphide solution the surface of the slide should be gently gone over with a tuft of cotton.

It is very important that the action of the sulphide should be complete, otherwise the slide will not have proper gradation and brilliance. For this reason if the sulphide solution is fairly dilute plenty of it must be used, and it must be renewed, if necessary, to complete the action. The degree of intensification cannot be altered by modifying the action of the sulphide. This depends entirely on the amount of metallic salt absorbed in the first instance.

It is quite easy to repeat the intensification indefinitely if desired. It is also possible to mix the metallic salts in certain cases. For example, some beautiful tones may be obtained by using a mixture of lead acetate and an iron salt. The iron sulphate is not so suitable for this purpose as the perchloride. This may be bought at the druggists in the form of a liquor, two or three drops to the ounce of water of which will probably suffice. This ferric chloride, followed by the yellow prussiate as used for uranium, should give a very fine blue.—T. H. Greenall in Amateur Photographer.

Uneven Tones

It sometimes occurs that sulphide-toned bromides show uneven patches, the brown being yellowish in one place and almost purple in another. This may be due to more than one cause. It may be uneven washing after fixing, whereby the deposit is locally reduced while bleaching, or it may arise from uneven action in the sulphide bath. It is well known that a weak or exhausted sulphide solution will not yield rich tones, and it is also agreed that if a

print is so toned it is useless to attempt to improve it by immersion in a stronger solution. These facts will explain why certain enlargements which were recently shown to us showed the defect to which we have referred. Starting as good black and white prints they were bleached and washed as usual. They were taken out of the washing water without draining and dumped quickly into a small quantity of sulphide solution, one print being laid upon another in quick succession. When the last print was in, the operator began to shift them over, and then it was seen that parts were fully toned while others had barely started; as these were exposed to the action of the sulphide they continued to tone, but never reached the same color as the rest of the print. The reason for this is obvious. The toning started with a sufficiently strong solution, but as more prints were immersed the solution became diluted, in addition to its being exhausted by its action on the silver. It may be worth noting in this connection that with poor flat prints the best colors can be obtained by using as strong a solution of sulphide as the paper will stand without blistering; the action is very rapid, and the prints should not be left in it a moment longer than is necessary.—British Journal of Photography.

Ferricyanide Reducer

Although this valuable solution has been known for nearly a generation, some operators still find difficulties attending its use. One of the commonest is the appearance of yellow stains which obstinately refuse to disappear, even with prolonged washing. There is often a general yellowing of the film which is rather persistent, but it will usually yield to sufficient treatment with running water; what is meant is that portions of the image which are to be altogether removed, as in the case of faulty margins of bromide prints turning to a light orange color which remains. This we have found to be due almost invariably to weakness of the hypo solution. Many workers take a little of the ordinary fixing bath, dilute it with from four to ten times its volume of water, and then add a fairly large quantity of ferricyanide solution. Our own practice is to use a 15 per cent. solution of hypo, and to add to that such proportion of ferricyanide as may be needed, this proportion having a very great effect upon the action of the reducer. With sufficient to give a very pale yellow color, the reduction is even and does not clear away shadow

detail before there is any appreciable action on the high-lights, while with stronger solutions the reverse is the case. It must be remembered that the mixed solution is quickly decomposed by bright light, and that the dish must be kept in motion or uneven markings will result. Fresh plain hypo solution, without any admixture of bisulphite or any other acid ingredient, must be used. Many failures are due to the use of old fixing baths.—*British Journal of Photography*.

The Feet in Portraiture

ONE of the greatest difficulties that the photographer encounters in the portraiture of fulllength figures is to give a satisfactory rendering of the feet. For this reason, perhaps the threequarter length figure is so popular, and is regarded by many operators as a solution of the problem, until there comes a day when some sitter requires a full-length portrait of himself. With feminine sitters the feet do not seem to be nearly so troublesome as is the case with men. The main difficulty—i.e., stiffness, may be overcome by simply posing the sitter easily and covering the awkwardness of the feet with graceful folds of the dress. As a general rule the most successful full-length portraits are standing figures, as when sitting there is a tendency on the part of the model to sit stiffly with the feet close together. Much may be done by placing one foot a few inches in advance of the other or even by turning it slightly sideways. With male sitters' crossing the legs, if a characteristic attitude of the individual, may tend toward eliminating stiffness. It is sometimes possible to swing the back of the camera, thus throwing the feet very slightly out of focus and suppressing them as far as may be, and another good plan is to reduce the lighting in this particular quarter. At times highly-polished boots will emphasize the ugliness of particularly ugly feet and threaten to strike an unpleasant note in the portrait. This may be explained to the sitter who allowed the superfluous "shine" to be dulled with a slightly damp cloth. In the case of a standing or leaning figure an accessory, such as a chair or rustic seat, may be employed to hide the feet if there is any tendency toward awkwardness. Many a photographer's show-case could give abundant examples of neglect in posing the feet, which a little attention would have remedied, and this may be said to be one of the little things which have a very real bearing upon pleasing results.—British Journal of Photography.

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